The Relationship between Audit Committees, Corporate Environmental Disclosure, and Environmental Reputation: UK Evidence

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THE RELATIONSHIP BETWEEN AUDIT COMMITTEES, CORPORATE ENVIRONMENTAL DISCLOSURE, AND ENVIRONMENTAL REPUTATION: UK EVIDENCE

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Abstract

The thesis examines the determinants of the volume of environmental disclosures and their quality, with particular reference to the role of audit committees and the role of such disclosures in the creation and sustenance of firms' environmental reputation. It also examines the impact of environmental reputation on enhancing firm financial performance. Using a resource-based view (RBV) and quality signalling approach, this study examines three questions: first, to what extent are the volume and quality of environmental disclosures determined by the resource base of the firm and the quality of its audit committee?; second, does the combination of quality disclosures and audit committee add to the reputation of the firm?; and finally, what is the relationship between corporate environmental reputation and firm financial performance?

Using a sample of UK FTSE 350 companies from 2007-2011, I found evidence that larger firms with higher quality audit committees make higher quality disclosures. These firms enhance their reputations by virtue of their size, the quality of their audit committees, the quality of their disclosures, and their board size. Larger firms with block shareholders tend to have greater volume of disclosures, whilst audit committees and larger boards tend to have no role in promoting such disclosures. Higher disclosure volume alone does not lead to increased reputation. These results therefore show support for the RBV quality signalling approach. Larger firms possess a greater resource base and, therefore, have the ability to invest in non-replicable corporate social responsibility (CSR) strategies. Audit committees, which possess Smith Report compliant features, promote reputation directly and through their determination of better quality disclosures that are difficult to replicate by competitors, thereby signalling the firm specific competitive advantage investments to the market.

When revisiting the relationship between environmental reputation and financial performance, results indicate a positive impact of corporate environmental reputation on financial performance measured by both accounting and market-based measures, and were consistent with the RBV of the firm. Findings in this study have implications for managers in terms of disclosure practices where the quality of disclosure is an important aspect and of a higher value due to the difficulty of replication by companies not genuinely committed to environmental good practice. Moreover, the study aims to provide managers with a better view of how governance and specifically audit committee can impact the setting of environmental goals and enhance accountability. Finally, corporations looking to regain trust with investors and other stakeholders need to take steps towards an environmental agenda.

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by

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LIST OF ABBREVIATIONS

AC	Audit Committee
CER	Community and Environmental Reputation
CERD	Corporate Environmental Responsibility Disclosure
CG	Corporate Governance
CONI	Consolidated Narrative Interrogation Instrument
CSR	Corporate Social Responsibility
NPV	Net Present Value
RBV	Resource-Based View
VRIN	Valuable, Rare, Inimitable, and Non-Replicable

DECLARATION

I declare that this thesis is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person, except where due acknowledgment has been made in the test. I confirm that no part of the material presented in this thesis has previously been submitted by me or any other person for a degree in this or any other institution.

STATEMENT OF COPYRIGHT

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CHAPTER ONE

INTRODUCTION AND OVERVIEW

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1.1 BACKGROUND AND MOTIVATION

In light of the growing public awareness of environmental issues and hazards, firms' environmental practices have become an important avenue in society to gain competitive advantage (Hart, 1995). The growth in community awareness and concerns has an influence on the decision by management to disclose information about the physical environment within corporate annual reports (Wilmshurst and Frost, 2000). Companies are also finding that they need to respond to the variety of stakeholders and satisfy their demands (e.g. shareholders, customers, employees, suppliers, environmental groups, government). The voluntary disclosure of environmental information by business firms will improve corporate responsibility among stakeholders and arguably will enhance its competitive advantage (Hart, 1995).

The government may also increase the legal requirements and regulations enforced on business activities as a reaction to the increasing environmental concerns in society, for example, the Energy Policy Act 2005 that has been adopted by the US government to provide incentives for firms to pursue effective environmental strategies. This energy legislation allows tax deduction for energy programmes (De Villiers et al., 2011). Moroever, pending regulations in the UK would require every publicly listed company to disclose ethical, social, and environmental risks in its annual report (Porter and Kramer, 2006), therefore companies are accountable for social issues to a large extent taking into consideration the financial risks associated with them. However, government itself complements rather than displaces or absorbs self-organising practices (Blanco et al., 2009: p.465).

Corporate environmental costs such as global climate change and habitat destruction incur potential risks that need a response from management. This leads to the fact that environmental information has an impact on investors' decision making (Murray et al. 2006). Investors may observe the risk to be similar across firms unless managers signal their actions and share certain information about their environmental behaviour, especially if higher returns are expected from such behaviour (Toms, 2002).

It is essential to consider the incentives and actions of those who are engaged in the policy and decision making process when examining firms' environmental policies (Haniffa and Cooke, 2005). Arguably, research in the area of corporate environmental responsibility would not be considered as complete unless corporate governance (CG hereafter) factors are included such as board and audit committee (AC hereafter) monitoring strength (Brown et al., 2011; Gibson and O'Donovan, 2007; Aguilera et al., 2006). Governance is an intervening variable that affects the firm's policy in dealing with external pressures (Blanco et al., 2009). The BP oil spill in the Gulf of Mexico in April 2010, which was considered the worst environmental disaster in US history, was linked to flaws in the CG system. This phenomenon shed light on the accountability value of CG in terms of structure and transparency (De Villiers et al., 2011). The issue that arises after the BP scandal was the lack of sufficient detail in determining how the company safety and risk management system has been strengthened, evaluated, mitigated and oversighted, and the role of the board and its sub-committees (Windsor and McNicholas, 2012). If a firm causes environmental accidents, such as in the BP case, or defies environmental regulations, consequences are not only related to fines and penalties a firm is obliged to pay, but most importantly the damage and loss of the firm's reputation and trust or a boycott of goods (Iwata and Okada, 2011).

CG is about the governance of corporations and activities they are engaged in, and it is a vital tool in monitoring managers' behaviour and facilitating their actions for the purpose of maximizing the value of the company (Cheng and Courtenay, 2006). The Companies Act 2006 in the UK requires quoted firms to provide a business review that includes information about their environmental practices. Given the significant recent development in the area of corporate environmental responsibility and CG, it stresses the role that CG plays in promoting strong environmental performance.

Increased international attention has been given to the potentially beneficial role of ACs, in the wake of Enron and other scandals. Scandals have eroded capital investors' confidence and there is a role which CG mechanisms could play in regaining this confidence (Said et al., 2009). In the UK, the Smith Report (2003) is the AC combined code of guidance; it covers a number of aspects related to ACs including its main role and responsibilities 3.1-3.4, meetings 3.5-3.10, resources 3.11-3.14, remuneration 3.15, skills, experience and training 3.16-3.19, relationship with the board 4.1-4.4. The Report states that "AC should include at least three members who should all be independent non-executive directors" (Smith, 2003). The chairman of the AC sets the number of meetings that should be held and the timing of those meetings. It is required that ACs must meet at least three times a year. The work of the AC is key to securing stakeholders' confidence in the financial statements of the company; it is a source of strength to the company and to its shareholders (Smith, 2003).

A recent global AC survey 2013 conducted by the Audit Committee Institute shows the importance of social responsibility issues in core practices. To a question related to risks that pose the greatest challenges on their companies (aside from financial reporting risk), 49% of respondents, representing the highest percentage, chose risks associated with uncertainty, volatility, economic, political and social risks. Another question

related to the frequency of discussing sustainability and CSR issues as part of the AC agenda; only 37% of respondents answered that these issues are not discussed (10% answered they should be), while 63% answered that these issues occupy a part of AC meetings either periodically (39%), annually (16%), or every meeting (8%) (KPMG, 2013). ACs are aware that they need to spend more time discussing the quality and consistency of such issues so company disclosure can be improved to better tell the company's story.

AC is an important mechanism to increase company transparency and encourage management to disclose more information. Moreover, it oversees the quality of reported information which will lead to enhancing the relevance and reliability of the context and content of annual reports. Most importantly, it reviews risk management systems, including risk associated with corporate social responsibility (CSR hereafter) issues, on an annual basis. ACs should challenge management on key sustainability issues, and significant reporting issues such as the clarity and completeness of disclosure contained within the annual report (Smith, 2003), and evaluate how the company is incorporating them to suit its own business strategy and governance objective (KPMG, 2010). It has been argued that effective AC is essential for effective governance (Zaman et al., 2011), and it follows in so far as governance mechanisms promote accounting disclosure practices, that ACs, bringing accounting skills and experience to bear, will have a positive and important influence on disclosure, including social and environmental disclosures.

ACs are associated with error reduction and regulatory compliance (Barako et al., 2006) and, hence, enhance internal control and improve disclosure quality (Ho and Wong, 2001). These effects are, in turn, reinforced by regulatory requirements. The UK Corporate Governance Code recommends that ACs be comprised of financially literate

members and at least one member should be a financial expert (FRC, 2010); such expertise assures the quality of financial reporting (Chen et al., 2006), and enhances the credibility of information provided to the market (Smith, 2003). Independent external assurance provided by ACs creates credibility and trust (Turley and Zaman, 2003), which in turn develops and maintains the intangible assets that comprise the firm's reputation and valorises competitive advantage. The independence and knowledge of AC directors play a role in determining, managing, monitoring and controlling the risks identified by management (Keinath and Walo, 2004). It is also likely that AC could help in assessing environmental reputation issues when auditing financial reports. It could help in enhancing the quality of environmental reporting by providing assurance, and therefore more reliable information to all stakeholders. Such audits will enhance the credibility of their environmental reports and build corporate reputation (Moroney et al., 2012).

Although prior literature has investigated the relationship between CG mechanisms and voluntary disclosures broadly defined (Cheng and Courtenay, 2006; Barako et al., 2006; Ho and Wong 2001), some were more specific and examined the relationship between CG and CSR (Gibson and O'Donovan, 2007; Halme and Huse, 1997; Jamali et al., 2008). To the best of my knowledge, no previous study has considered the specific impact of effective AC on disclosure practices and environmental reputation. This study also examines the role of other governance mechanisms in conjunction with audit committees. In doing so, it builds on prior literature that examines the determinants of the volume of disclosures and their quality, which include, size, financial and industry effects, and the role of such disclosures in the creation and sustenance of environmental reputation. Finally, the study examines the impact of environmental reputation, as a proxy of rated or scored assessments of environmental performance on financial

performance. Much of the literature suggests there might be a range over which environmental concern 'pays' but after a point there is a trade off between environmental concern and financial performance. The study revisits this relation and provides updates to the controversies in the literature within the resource-based view perspective (RBV hereafter). RBV supports a positive relation (reconciling to the above, it indicates, perhaps, that the above range might extend further than thought).

Prior literature has aimed to explain accounting disclosures in terms of legitimacy theory (Wilmshurst and Frost, 2000; Cormier and Gordon, 2001) where firms need to ensure that their activities are acceptable to society so they tend to disclose information about such activities to fulfil their needs for legitimacy. Other studies explain accounting disclosures and management strategy using a variety of stakeholder-based approaches (McGuire et al., 1988; Roberts,1992; Van Der Laan et al., 2008). A notable stakeholder three-dimensional approach has been provided by Roberts (1992) to explain the link between social disclosure and social and economic performance: (i) stakeholder power that represents the management strategy of being socially responsible to satisfy stakeholders; (ii) strategic posture where firms gain an active social position when they engage more in environmental and social practices; (iii) firms' economic performance is the third dimension where it is positively associated with socially responsible practices. Finally there are studies that use agency theory to explain firms' disclosure practices (Ness and Mirza, 1991; Arora and Dharwadkar, 2011) where such disclosures reduce the agency problem and have the purpose of increasing management welfare. To some extent these theories are mutually exclusive (Adams, 2002; Gray et al., 1995).

The resource-based view quality signalling approach builds on the agency approach and the link between competitive advantage and CSR (Porter and Kramer, 2006; Mallin et al., 2012). Competitive advantage according to the RBV theory could be achieved

when resources and capabilities related to natural environment are bundled and exploited efficiently (Barney et al., 2001). Russo and Fouts (1997) argue that firms endowed with tangible resources such as physical assets and technologies, intangible resources such as reputation for leadership in environmental issues, and personnel-based resources such as organisational pledge, engagement and skills are able to use such capabilities to achieve competitive advantage, and avoid a trade-off between green and being competitive (Blanco et al., 2009). Thus, the RBV theory has motives of including CSR issues that can contribute to competitive advantage for green firms (McWilliams and Siegel, 2011). CSR investment should only be made and only enhance competitive advantage when there are positive Net Present Values (NPVs).

Another issue with prior literature is that empirical studies which have used the most standard methodology, i.e. content analysis of the annual reports in examining the relationship between environmental disclosure and environmental performance, will not necessary control for the realistic qualitative aspect of managerial action (Salama, 2003). Firms with greater resource endowments have greater resource base allowing them to engage in strategic investments including CSR investments. Such investments need to be transmitted positively into the firm reputational capital, and this could be achieved through genuine qualitative signals to the most powerful stakeholder groups, since CSR investments give rise, at least in part if not substantially, to intangible assets creation.

The volume of disclosure where data is captured by words (Gao et al., 2005), sentences (Perrini, 2005; Wilmshurst and Frost, 2000), pages (Unerman, 2000) and high/low disclosure rating (Patten, 1991), gives an insight about the importance of such disclosures. However, volume alone cannot be used appropriately to analyse the firm commitment to the environment. It could be interpreted as pure narrative, lack

credibility, be less reliable and more self-congratulatory, thus is insufficient itself to create reputation (Toms, 2002). In prior literature, quality relates to the comprehensiveness of disclosures based on best practice (Hooks and Van Staden, 2011), and degree of specificity (García-Meca and Martínez, 2005; Ryan et al., 2002; Tooley and Guthrie, 2007). In this study, quality specifically relates to the difficulty of replication by competitors. Building on the work of Hasseldine et al. (2005), disclosures are measured in this study using both quantitative and qualitative indicators and with combinations of both. The study's position follows from earlier empirical studies; Toms (2002) and Hasseldine et al. (2005), that have shown a stronger impact for higher quality difficult to replicate disclosures. These studies' methodology gives a higher qualitative scale to the difficulty of imitation and a lesser qualitative scale was given to general rhetoric which by definition is easier to replicate. However, these studies did not consider certain CG variables, particularly the role of ACs in the creation of reputational capital. There are good reasons to expect that ACs add to the quality of environmental disclosures, and by the same virtue increase firm environmental reputation.

Finally, prior literature addressed the modelling issue between financial performance, environmental disclosure and environmental reputation where these relationships suffer from measurement problem, fail to deal with causality, and omitted variables problems, which are often compounded by inadequate theory. For Ullmann (1985: p.552), the omitted variable is management strategy. RBV quality signalling approach finds a solution to these modelling problems. CSR activities and disclosure follows form resource endowment, since without such endowment, quality signalling of competitive advantage investments is not possible. Therefore, it is more likely that qualitative difficult to replicate disclosure is a proxy for managerial strategy, i.e. managerial CSR strategy does not contribute to unobserved heterogeneity, and that

environmental reputation is an outcome for managerial strategy. Moreover, environmental disclosure is a function of CG that serves to enhance environmental reputation; therefore CG also corresponds closely to managerial strategy.

1.2 EXPECTED CONTRIBUTIONS TO KNOWLEDGE

This thesis expects to contribute to the corporate environmental responsibility knowledge in three main areas.

First, the study presents evidence to test how the quality of ACs impacts on disclosure practice. It thereby builds on prior studies that examined the relationship between CG and CSR (Gibson and O'Donovan, 2007; Halme and Huse, 1997; Jamali et al., 2008), by considering the specific impact of effective AC on environmental reputation. The study also examines the role of other governance mechanisms in conjunction with ACs. It uses a sample of UK FTSE 350 companies during the period 2007-2011, and thereby updates the evidence from earlier empirical studies that have shown a stronger impact for higher quality, difficult to replicate disclosures (Toms, 2002; Hasseldine et al., 2005).

Second, the study measures disclosures in corporate annual reports using the consolidated narrative interrogation instrument (CONI hereafter) approach that has been introduced to the literature by Beck et al. (2010). CONI is based on dual qualitative and volumetric measurement which is therefore particularly suitable to a study of this kind, which requires a measure of disclosure quality that corresponds to the difficulty of replication in terms of valuable, rare, inimitable and non-replicable reputational assets, as well as an aggregate volume measure. As a consequence, this study will be the first to apply the CONI approach to examine CG and related determinants of environmental disclosures.

The CONI approach consists of three steps (Beck et al., 2010): Step1- coding content diversity where the narrative of firms' annual reports is analysed into categories at phrase level. Such coding increases validity, for example, by decreasing the

likelihood of double coding (Campbell and Abdul Rahman, 2010). Step 2- coding content quality based on five types that provide an indicator of quality disclosure: Type1- a pure narrative disclosure such as issues related to categories definition; Type 2- a pure narrative disclosure with more details related to disclosure in each category; Type 3-quantitative disclosure addressing issues related to categories mentioned in Appendix1; Type 4- quantitative and qualitative disclosure of the categories; Type 5- quantitative, qualitative and comparable disclosure. Although CONI is a new approach, the typology used in the language of CONI in terms of disclosure quality provides a similar, incremental hierarchy method of classifying the quality of disclosures to that used by Toms, (2002) which applies thresholds according to relative difficulty of replication. According to CONI, disclosure of quantitative information is of higher quality than a mere narrative because it either cannot be replicated without actual investment at a similar level or can only be claimed through deliberate misstatement. Cross coder reliability tests resulted in a Krippendorff alpha value of 87.8% (Krippendorff, 1980).

Third, the study provides an up-to-date empirical investigation on the relationship between corporate environmental reputation and corporate financial performance on companies covered by the Britain's Most Admired Companies (MAC) survey carried out by *Management Today* in terms of 'community and environmental responsibility' for the period 2007-2011. In doing so, this thesis aims to extend previous literature and address the controversy regarding the impact of environmental performance, taken to correlate with environmental reputation, on firm financial performance. Such controversy relates to the proper role and activities of corporations. For instance, do and should businesses concentrate only on profit making or compromise on profits by extending environmental friendliness? Firm performance is measured using both

accounting and market-based measures. Combining both measures with research on environmental performance should cover the different views, and reach some agreement about how best to evaluate a firm's financial performance. Moreover, this study uses a regression method that has been used in longitudinal studies, specifically panel data analysis with robust standard errors which helps to control for outliers and firm's unobserved specific effects and consequently get more valid results (Elsayed and Paton, 2005).

Finally, the contribution of the study lies in its findings that could assist regulators and policy makers and be of relevance to the market community. I believe that managerial and regulatory implications should be strengthened in terms of the role that effective audit committee plays in improving environmental practices. Audit committees need to address environmental responsibility issues as vital elements of firms' business strategies, and they need to monitor, manage, and modify the risks associated with these issues and their potential impact on the business environment. Audit assurance will help to discriminate between true commitments of firms towards environmental responsibility and false claims so the latter is unlikely to result in added value. The difficulty of replication criteria of audited figures will develop and maintain firm's environmental reputation and generate competitive advantage.

Although social and environmental reporting is not mandatory, it eventually could become a standard aspect of the company annual report where a successful business needs to link company value with social progress. Engaging CSR issues in the audit process can impact the setting of social and environmental goals and enhance accountability. This can be achieved by reviewing and discussing social and environmental practices by firms during audit committee meetings on regular basis, challenge management on key sustainability issues and significant reporting practice,

and the identification and assessment of risks associated with social and environmental practices.

RBV provides a suitable basis on the creation of reputational capital including environmental reputation. Firms with resource endowments, such as greater size, that give rise to scale and scope effects and higher profit provide managers with incentives to invest in firm-specific competitive advantage generating resources and engage in projects, including CSR projects, that are positive NPV. Moreover, pressure that managers face from shareholders will provide them with incentives to signal about their strategic activities that will lead to a reduction in information asymmetry problem (Toms, 2002). In order for such activities to be valorised by firms with higher capability, it is necessary that they are transmitted positively through qualitative channels into the firm's reputational capital. Quality signals that are necessary through accounting disclosures are competitive advantage investment disclosures referring to those that evidence difficult to replicate investments and will fulfil the condition where disclosure is quantifiable, specific, therefore audited or auditable. Such disclosures contrast with mere volume disclosure that does not appear to offer any help than mere rhetoric in creating reputation. It could be interpreted as 'vague statements' of commitment to environmental protection or 'greenwash' that might be made by competitors unable to afford similar investment.

CG and ACs are essential moderators of the relationship between resource endowment and disclosure and between the disclosure quality signal and the creation of reputation. They also moderate the pressure from shareholders which may affect managers' capacity to develop new strategies (Toms, 2002). CG mechanisms help to create competitive advantage. The role of CG differs in different stages between providing resources that add value and providing monitoring expertise (Barney et al.,

2011). The board of directors provides guidance on best practice, and weak governance mechanisms associated with spare cash flow will reduce shareholders' value (Jensen, 1986). AC reduces information asymmetry (Healy and Palepu, 2001) and uncertainty and provides increased assurance (Watts and Zimmerman, 1983), hence assisting investors in evaluating the impact of voluntary un-audited disclosures in terms of future earnings (Rajgopal et al., 2003). Audited figures disclosed in annual reports are more difficult to replicate; they will develop and maintain the intangible assets that comprise the firm's environmental reputation and generate competitive advantage. This is especially enhanced through suitable professionals and different skills of audit committees. Most importantly, audit assurance will help discriminate between genuine investment or true claims and false claims from competitors about commitment to sustainability (Lyon and Maxwell, 2011).

Signalling theory forms a link between resource endowment and governance perspectives in terms of their interpretation of signals about managerial activities provided in annual reports. Environmental disclosures are more likely where investors proactively and continually monitor using voice-based governance mechanism (Toms, 2002: p.260) especially that investors are more interested in financial matters of the firm. Managers may also give little care to environmental issues because they lack knowledge and resources (De Villiers et al., 2011). The board that is composed of directors with different skills and experiences can provide access to useful environmental resources to assist in strategic decision making, and have the specific knowledge required for ensuring strong environmental performance (De Villiers et al., 2011).

Finally, according to RBV framework, the firm's ability to collect, control, and exploit resources will result in greater long-term financial performance. Firms that

devote more resources to support its environmental commitment and improve its environmental performance will enhance its value in the market and secure better financial performance (Wahba, 2008). Corporate environmental responsibility is viewed as valuable resources that can be utilized to achieve a competitive advantage of the firm over its rivals (Wahba, 2008). Assets that are valuable and rare such as environmental reputation enjoy a sustainable advantage that expects to earn higher returns. Although researchers have been debating and giving rational theoretical justification for positive, negative and neutral links between environmental performance and firm financial performance, such debate is based on the proper role and performance of corporations. In other words, should business concentrate on profit making or compromise on profits by extending environmental friendliness? The RBV supports competitive advantage of green firms (Blanco et al., 2009). Firms that are endowed with a larger set of tangible and intangibles resources can increase their economic results for certain abatement efforts (Blanco et al., 2009).

From the above expected contributions, the following main research questions will be investigated:

1. If qualitative disclosures are indeed of greater value than a mere quantity, to what extent are they determined by the presence of robust governance procedures, including the use of ACs subsequent to the Smith Report and Combined Code? The answer to this question should provide stronger evidence related to determinants of environmental disclosures, specifically the quality and quantity of these disclosures in UK companies.

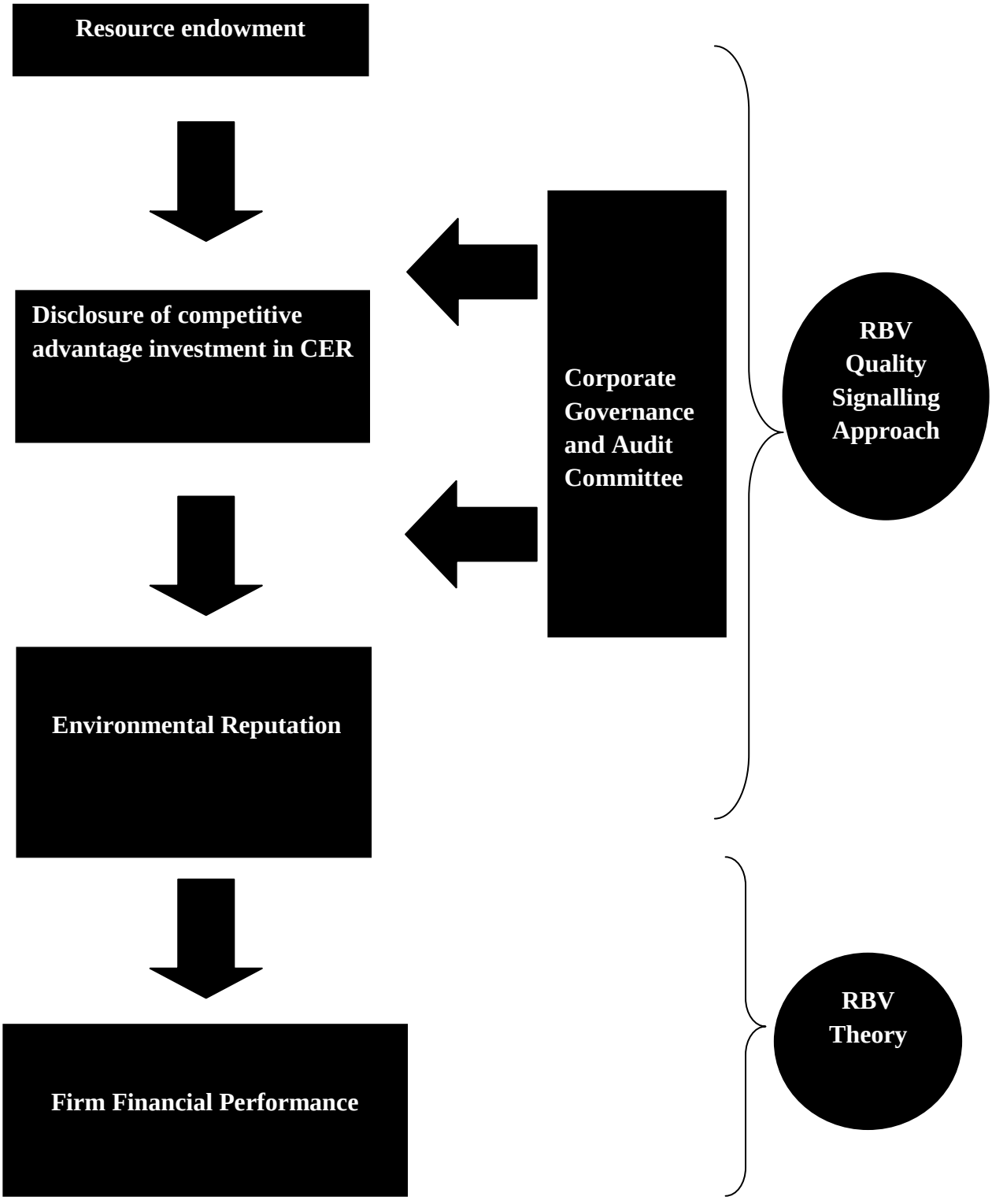
2. Does the combination of quality disclosures and effective ACs add to the reputation of the firm? The answer to this question provides a foundation in terms of

determinants of firms' corporate reputation, particularly the 'community and environmental reputation' (CER hereafter) of these firms.

3. What is the relationship between corporate environmental reputation and firm financial performance? Through understanding this relationship, the direction of future research to improve environmental performance may be established due to the long-term value it adds.

Figure 1.1

Main Research Questions



1.3. STRUCTURE OF THE THESIS

This section will give a brief outline of each of the chapters in the thesis. Chapter two examines empirically the impact of CG mechanisms, specifically ACs on environmental disclosure practices in the UK, measured using the CONI approach by Beck et al. (2010) which is based on dual qualitative and volumetric measurement.

Chapter three presents a comparison between qualitative and quantitative reporting of environmental information disclosed in annual reports and compares their relative impact on the environmental reputation of UK firms. It also considers the role of AC and board of directors in the creation of this kind of reputation.

Chapter four provides up-to-date empirical evidence of the relationship between corporate environmental reputation and corporate economic performance within the British context.

The conclusion of the study is presented in chapter five. It presents a synopsis of the study and its main findings, the implication of the research, its limitations, and potential future research.

CHAPTER TWO

THE RELATIONSHIP BETWEEN AUDIT COMMITTEES AND CORPORATE ENVIRONMENTAL DISCLOSURES

CHAPTER TWO

THE RELATIONSHIP BETWEEN AUDIT COMMITTEES AND CORPORATE ENVIRONMENTAL DISCLOSURES*

2.1 INRODUCTION

There has been a growing public awareness of the environmental impact of companies and the role they can play beyond their primary economic functions (Belkaoui, 1976; Gray et al., 1995). This was also accompanied by the awareness of government and businesses that environmental security and economic growth are not always in conflict. Corporate social responsibility (CSR) can be defined as the voluntary action and initiation by companies to contribute to a better society and a cleaner environment hence satisfying a variety of stakeholders (Gyongyi, 2008). Corporate environmental responsibility is considered as the environmental aspect of CSR that covers all environmental implications of the firm's activities.

The growth in community awareness and concerns has an influence on the decision by management to disclose information about the physical environment within the corporate annual report (Wilmshurst and Frost, 2000). Management may also need to disclose environmental information to satisfy the demands of a variety of stakeholders (Elkington, 1994). Such disclosures will improve corporate responsibility among stakeholders and arguably will enhance its competitive advantage. The government may also increase the legal requirements and regulations enforced on business activities as a reaction to increased environmental concerns in society. These new regulations will

* This chapter has been reviewed by the *British Accounting Review (BAR)* in a paper with co-authors: Professor Steven Toms & Dr Aly Salama

result in corporate management disclosing more environmental information (Wilmshurst and Frost, 2000; Sun et al., 2010).

It is also essential to consider the incentives and actions of those who are engaged in the policy and decision making process when examining disclosure practices (Haniffa and Cooke, 2005). Arguably, research in the area of social and environmental responsibility would not be considered as complete unless CG factors are included such as board and AC monitoring strengths (Brown et al., 2011; Gibson and O'Donovan, 2007; Aguilera et al., 2006). CG is about the governance of corporations and activities they are engaged in, and is a vital tool in monitoring managers' behaviour and facilitating their actions for the purpose of maximising the value of the company (Cheng and Courtenay, 2006). Investors and regulators are becoming more aware of the reputational and financial risk associated with social and environmental issues. Therefore, board members and senior management need to alleviate shareholders' concerns about such issues (Cheng and Courtenay, 2006).

Quoted companies are required by the Companies Act 2006 in the UK to produce a business review in which they must include information related to social and community issues and environmental matters (including the impact of the company's business on the environment) (Out-Law, 2012). Accounting researchers view the function of ACs as a mechanism of accountability where it assures the quality of financial reporting (Brennan and Solomon, 2008). However, ACs' accountability role needs to go beyond that to improve the quality of reporting as well by providing reliable and credible information to all stakeholders. Although the UK CG code 2010 does not mention explicitly the importance of social and environmental issues, there is some acknowledgment that the company's duties extend beyond its shareholders: "the board should set the company's value and standards and ensure that its obligations to its

shareholders and others are understood and met" (FRC, 2010) supporting principles, A1.1.

Increased international attention has been given to the potentially beneficial role of ACs, in the wake of Enron and other scandals. In the UK, the Smith Report (2003) is the AC combined code of guidance where "it is designed to assist company boards in making suitable arrangements for their ACs, and assist directors serving on ACs in carrying out their role" (p.3). The code covers a number of aspects related to ACs including: its main role and responsibilities (2.1), membership and opportunities (3.1-3.4), meetings (3.5-3.10), resources (3.11-3.14), remuneration (3.15), skills, experiences and training (3.16-3.19), relationship with board (4.1-4.4) where it states " the audit committee should review annually its terms of reference, and its own effectiveness and recommend any necessary changes to the board" (4.2). Hence this addresses the point that effective AC is essential for effective governance (Zaman et al., 2011), and it follows insofar as governance mechanisms promote the quantity and quality of accounting disclosure, that ACs, bringing accounting skills and experience to bear, will have a positive and important impact on disclosure including CSR disclosures. AC may have an important role to play in addressing social and environmental responsibility issues through identifying, managing, and monitoring the risks associated with these issues. The CG code is concerned with securing the interests of all stakeholders as well as holding the balance between economic and social goals. ACs' main goals are reviewing the company's internal control and risk management systems, and assessing the effectiveness of company risks. AC could help in assessing not only financial risks but also those related to social and environmental risks when auditing financial reports.

In theory, the study uses the RBV and quality signalling approach to examine the determinants of corporate environmental disclosures where ethical actions are designed

to create reputational assets that are valuable, rare, inimitable, and non-replicable (VRIN hereafter) (Barney et al., 2011). Managers have strong incentives to signal the value of their investment using annual reports disclosures. ACs reduce agency cost and the conflict running between managers and shareholders by providing substantive oversight of financial reporting (Collier and Gregory, 1999) and information asymmetry problem (Healy and Palepu, 2001), and uncertainty, and provides increased assurance (Watts and Zimmerman, 1983). Moreover, AC assurance will help discriminate between genuine investment or true claims and false claims (greenwash) (Lyon and Maxwell, 2011), so that a mere volume of disclosure is unlikely to result in added value. The criteria mentioned above will help to develop and maintain the intangible assets that comprise the firm's reputation and valorise competitive advantage, therefore, effective governance can itself be a source of competitive advantage.

The study presents evidence to test how the quality of AC impacts on disclosure practice. It thereby builds on prior studies that have examined the relationship between CG and CSR (Gibson and O'Donovan, 2007; Halme and Huse, 1997; Jamali et al., 2008), by considering the specific impact of effective AC on environmental disclosure practice. The study also examines the role of other governance mechanisms in conjunction with audit committees. It uses a sample of UK FTSE 350 companies during the period 2007-2011 and thereby updates the evidence from earlier empirical studies that have shown a stronger impact for higher quality, difficult to replicate disclosures (Toms, 2002; Hasseldine et al., 2005). Its purpose is to answer the question: if qualitative disclosures are indeed of greater value than a mere quantity, to what extent are they determined by the presence of robust governance procedures, including the use of ACs subsequent to the Smith Report and combined code? To answer this question, the study measures disclosures in corporate annual reports using the consolidated

narrative interrogation instrument (CONI) approach that has been introduced to the literature by (Beck et al., 2010). CONI is based on dual qualitative and volumetric measurement which is therefore particularly suited to a study of this kind which requires a measure of disclosure quality that corresponds to the difficulty of replication in terms of VRIN characteristics as well as an aggregate volume measure. As a consequence, the study will be the first to apply the CONI approach to examine CG and related determinants of environmental disclosures.

The reminder of this chapter is organised as follows. The first section provides an outline of the prior literature that explored the relationship between corporate social and environmental disclosures and CG mechanisms leading to a hypothesis suitable for answering the research question in the second section. The research method applied to examine the data set is outlined in the third section. The fourth section presents data analysis and empirical results. The final section presents a brief conclusion.

2.2 LITERATURE REVIEW

2.2.1. Corporate Governance Mechanisms

A number of studies have investigated the relationship between CG mechanisms and voluntary disclosures broadly defined (Cheng and Courtenay, 2006; Barako et al., 2006; Ho and Wong 2001; Eng and Mak, 2003), and some were more specific in association with increases in the volume of CSR disclosures (Gibson and O'Donovan, 2007; Haniffa and Cooke, 2005).

A longitudinal study by Gibson and O'Donovan (2007) examine the link between good CG and the concept of corporate social and environmental responsibility. More specifically, improvements in CG are associated with increases in the volume of CSR disclosures, and it might be expected that these changes should also be associated with improvements in the quality of disclosure. The study relies on stakeholder theory, legitimacy theory and the political economy of accounting argument in explaining the reasons behind companies' aims to disclose more environmental information within annual reports. Companies provide a wide range of information including environmental information within annual reports in order to satisfy a variety of stakeholders; priority is given to those who have control over firm resources. According to legitimacy theory, companies disclose information in order to fulfil society's demand as if there is a social contract between organisations and societies. Finally Gibson and O'Donovan (2007) rely on the political economy argument where company disclosure is an attempt to avoid political costs due to information asymmetry among varying positions of stakeholders. The study shows that an increasing number of Australian companies disclosed environmental information during the period 1983-2003

concluding that the amount of environmental information provided in corporate annual reports will increase over time.

Haniffa and Cooke (2005) investigate the potential effects of culture and CG on social disclosures of 139 listed firms on the Kuala Lumpur Stock Exchange (KLSE) during the period 1996-2002. They measure corporate social disclosure in annual reports using an index that covers items such as environment, employee, community, and product and value added. Disclosure extent is measured by number of corporate social disclosure items included in the index while disclosure variety is measured by number of words used. The results show a significant positive association between corporate social disclosure and CG characteristics such as board dominated by executives, chair with multiple directorship and foreign ownership. However the study use of proxies to measure CG was limited by available data. In addition using words to measure the length of corporate social disclosure may be affected by the possibility of double coding when words take a part of one or more disclosure categories (Campbell and Abdul Rahman, 2010).

Halme and Huse (1997) examine the relationship between corporate environmental reporting in annual reports and CG variables, industry and country variables. Firms' annual reports were categorised into three groups based on the extent of corporate environmental information disclosed. The first group represents annual reports that contain little or no environmental information, the second group includes annual reports with environmental sections where firms go beyond recommended standards, and the third group contains firms that adopt environmental policy. Findings show that although CSR disclosures are associated with industry and country variables, there is no significant association with CG. The study uses a simple type of categorisation of environmental information disclosed in corporate annual reports, such categorisation

will not be able to capture the enriched extent of environmental information provided in annual reports.

Said et al. (2009) examine the impact of CG characteristics namely board size, board independence, duality, AC independence, substantial ownership, managerial ownership, foreign ownership and government ownership on the level of CSR disclosures of Malaysian publicly listed firms. The study argues that firms engaging in CSR initiatives will secure better financial performance and access to capital. These firms will also enhance their corporate image and reputation, increase sales and customer loyalty, and attract ethical investors. CG system provides guidance and ensures that shareholders' interests are met. The study uses a sample of 150 listed Malaysian firms for the year ended 2006. CSR data were collected from annual reports and companies' websites. CSR index was constructed by adding all items from the two sources of data, and covering five themes, i.e. environment, community involvement, human resources, energy and product. Disclosure was measured using the dichotomous 1 if the company discloses the items and zero otherwise. Control variables included were size and profit.

Results indicate a significant positive relationship between government ownership and substantial ownership, and the extent of disclosure. AC independence also shows a weak positive association with the level of CSR disclosure. Results indicate that governments add pressure on firms to disclosure additional information because of the value of being a publicly trusted agency. The study examines the impact of CG on CSR in one year; a longitudinal analysis is important and should add robustness to the findings. Moreover, the study uses only one aspect of AC, namely AC independence, arguing that the effectiveness of ACs are determined by their members' independence due to the role they play in reducing agency costs and provide internal control which

should enhance the quality of financial reporting. However, reflecting the impact of all AC characteristics, i.e. independence, meeting, size and expertise in one compute will provide a substantive oversight over the role that ACs could play in assessing CSR disclosures.

Moroney et al. (2012) examine whether the quality of environmental reporting is better when assured. Assurance enhances the credibility of environmental information disclosed which should lead to a better environmental management system. An assurer could be an accountant or consultant. This study investigates the effect of each type on assured company. The study uses stakeholder-agency theory where it states that managers are unique stakeholders since they have control over the decision making process in the company. It is in their interests to enhance monitoring of financial and non-financial disclosure in order to satisfy stakeholders' demands. Stakeholders' interest in corporate environmental issues increases the demand of assured environmental disclosures. Thus, according to stakeholder-agency theory, the monitoring of management-stakeholder contracts moves to a new level that requires assured environmental disclosures.

Moroney et al. (2012) uses a sample of the top 500 public companies listed on the Australian Securities Exchange (ASX). Using an index based upon the Global Reporting Initiative (GRI), the study applies content analysis to measure the quality of environmental reporting. A rating scale from zero to six is used to measure the amount of disclosure in stand-alone reports and annual reports. Findings show that the quality of environmental disclosure is higher for assured companies than un-assured ones. Also, no difference in the results has been noted regarding the impact of the assurer whether accountant or consultant. This study highlights the importance of experience in

improving the quality of environmental reporting; however it ignores other factors that might affect the quality of environmental disclosure such as CG effectiveness.

Kolk and Pinkse (2010) examine the notion that CSR disclosure reflects the expansion of CG accountability to suppliers of finance to include a broader range of stakeholders groups. The study focuses on multinational enterprises' (MNEs') CSR policies, specifically Fortune Global 250 firms that report widely on social and environmental issues. Those companies are facing higher pressure to become more transparent in their disclosure practices where CG and CSR can become integrated. The study also tests whether other features such as sectors and country of origin will have an impact on CSR practices. Corporate social responsibility has internal dimensions, such as employees' working conditions and ethical behaviour of managers and employees, and external dimensions such as global environmental problems like those related to climate change. The study argues that CG has substantial influence on internal CSR issues. Thus, it is more likely to be integrated into MNEs CSR disclosures. However, only MNEs' facing pressure to report extensively on social and environmental issues stress the importance of internal CSR and incorporate them in their disclosure practices.

Kolk and Pinkse (2010) adopt the stakeholder approach which explains that profit maximisation is not the only goal for businesses but also stakeholders' interests. Using a sample of 161 firms in the Fortune Global 250 firms, the study applies a quantitative scale of content analysis and uses two measures of the integration between CG and CSR based on binary indicator. The first measure investigates whether the concept of CG was explicitly linked to CSR issues, and the second measure tests whether companies using a separate section on CG in their CSR disclosures disclose more about CSR. Control variables include country of origin, sector, size and profitability. Findings show that firms with extensive reporting of social and environmental responsibility issues are

more likely inclined to explicitly integrated CG to CSR issues, and/or have a separate CG section. The insignificance of control variables suggests that the integration of CG in CSR reporting is becoming a global issue that goes beyond countries and sectors.

Mallin et al. (2012) investigate the impact of CG on social and environmental disclosure. They develop holistic measures of both monitoring intensity and stakeholders' orientation of CG. The study considers both the extent and the quality of social and environmental disclosures and argues that using both the extent and the quality of social and environmental disclosures helps to identify whether information disclosed basically is used to signal firms' superior performance or rather as a legitimacy tool to cover poor performance. The monitoring intensity of CG is measured by the presence of independent directors on the board, the absence of CEO duality, and ownership structure, while the stakeholders' orientation attribute of CG is captured by the presence of active institutional shareholders, ownership diversity, board composition, community influential, women directors, and CSR committee.

Mallin et al. (2012) measure the extent of disclosure using content analysis techniques and disclosure quality is measured using a (0-3) scaling system where the highest score is given to quantitative or financial data. Using a sample of 100 US Best Corporate Citizens in the period 2005-2007, results show that CG is positively associated with corporate social performance and social and environmental disclosure for stakeholders' orientation and monitoring measure.

A number of studies were less specific, and examine the impact of CG on voluntary disclosure broadly defined. Eng and Mak (2003) investigate the impact of ownership structure such as managerial ownership, block holder ownership and governmental ownership, and board independence on voluntary disclosure. Voluntary disclosure is

measured using an aggregate score of strategic, financial and non-financial information contained in the annual reports. Ownership structure measured by the proportion of shares held by managers and block holders is argued to be negatively associated with voluntary disclosure. Also board independence measured by the proportion of outside directors is argued to have a positive impact on voluntary disclosure. Control variables include size, leverage, growth opportunities, industry, auditors whether Big Four or not, number of analysts' following, and profitability. Using a sample of 158 firms listed on the Singapore Stock Exchange, findings show negative correlation between managerial ownership and voluntary disclosure. However, inverse to the predicted direction, board independence proves to have negative impact on voluntary disclosure. Eng and Mak (2003) explain that outside directors may be able to attain information directly rather than from public disclosure since they represent block holders' interests. Also results show that larger firms with lower debt disclose more.

Ho and Wong (2001) test the effect of four CG mechanisms viz. board independence, presence of AC, board duality and percentage of family members on board on voluntary disclosure. Dependent variable is measured using an importance-adjusted relative disclosure index (RDI). It consists of 35 items in a survey questionnaire where analyst users were asked to rate the importance of items on a 5-point scale. Using a sample of 98 Hong Kong listed firms' respondents to a survey in 1997-1998, results show that existence of AC is positively significantly related to voluntary disclosure. It enhances internal control and improves disclosure quality.

Barako et al. (2006) also come up with similar findings in terms of AC impact. The study examines the effects of CG mechanisms, ownership structure and firm specific characteristics on voluntary disclosure in a longitudinal study applied on Kenyan listed companies during the period 1992-2001. The study uses weighted disclosure index to

measure the level of disclosure. Disclosure scores is based on whether the entity discloses an item or not where weights are given to rate the importance of each item on a scale from 0-4. Findings show that the existence of AC measured by a dichotomous variable is positive and significantly associated with voluntary disclosure. Also institutional and foreign ownership have significant positive impact on voluntary disclosure. However board independence proves to be significant but negatively related to voluntary disclosure. The study argues that board independence is a substitute of disclosure. It concludes moreover that audit committees are associated with error reduction and regulatory compliance.

Cerbioni and Parbonetti (2007) examine the association between CG variables viz. board independence, board dimension, CEO duality, and board structure and voluntary disclosure. The study tests whether CG and voluntary disclosure is a complement or a substitute for accountability. The study measures voluntary disclosure including financial and non-financial information by codifying qualitative and quantitative information into categories. It also uses a sample of 145 European biotechnology companies during the period 2002-2004, and controls for leverage, size, growth, profitability, country of origin and ownership strength. Results show that board-related variables strongly influence the quantity of information disclosed. However in terms of qualitative disclosure, not all governance variables proved to be significant. This could be due to the fact that the qualitative measure used in this study, which is based on the existence of historical or forward looking information, is subjective and complex.

A number of studies have specifically examined the effects of AC characteristics on financial reporting. Abbott *et al.* (2004) examine the effect of certain AC characteristics identified by the Blue Ribbon Committee on reducing the frequency of restatements and consequently enhancing the quality of financial reporting. AC characteristics are AC

size, independence, expertise, and meetings where it is argued that they are all associated with lowering the level of restatement incidents. The study uses a sample of 88 firms with restatement incidence in annual reports during the period 1991-1999. Results support BRC's recommendations regarding AC independence, meetings, and expertise concluding that such recommendations support AC effectiveness. However AC effectiveness might vary in different regulatory and institutional settings.

Magena and Pike (2005) also examine effective AC influence on interim disclosure policy. They empirically investigate the association between AC characteristics viz. AC independence, AC size and AC expertise and the level of disclosure in interim reports. Magena and Pike (2005) argue that auditing interim reporting should prevent any managerial opportunistic behaviour and reduce information asymmetry between managers and investors. The study also controls for other CG mechanisms such as board independence, institutional shareholding and external auditors' involvement. Also some firm's specific characteristics were incorporated, such as firm size, multiple listing, gearing, interim profits, liquidity and executive director shareholding. Interim disclosure is measured using weighted and un-weighted disclosure index based on the publication of financial and nonfinancial information in interim reports. Using a sample of 262 listed firms on the London Stock Exchange (LSE) in 2001-2002, the study concludes that effective AC is essential in improving reporting oversight. A significant positive relationship was provided between AC expertise and interim disclosure. Moreover, AC independence measured by share ownership of AC members is proved to be negatively associated with interim disclosure. A possible drawback on this study is the subjectivity in measuring the level of disclosure in interim reports (giving weights to each disclosure item based on analyst perception). Also the study applies a cross-sectional analysis that

is unable to capture disclosure impact over time; hence a longitudinal analysis is more powerful.

Beasley et al. (2009) provide a qualitative AC research using an interview technique to examine the monitoring role of AC. They argue that such technique is able to capture problems arising from personal relations with management more than the quantitative technique. The study uses a theoretical framework based on the conflict between agency theory and institutional theory. Agency theory views ACs as monitoring agents; they provide vigilant oversight to financial reporting whereas institutional theory looks at the AC role as ceremonial and intended to create legitimacy. The study interviews 42 AC members serving on US public companies in the period 2004-2005. Respondents' views on whether the AC role is substantive or ceremonial were mixed, however they were weighted more towards monitoring practices. The study concludes that AC role is based on management's attitude towards governance and AC effectiveness. When management appreciates governance then audit committees are more likely to act as monitoring agents. Beasley et al. (2009) suggest a combination of agency theory and institutional theory for better overview and understanding of the AC role. This study is based on AC practices in 2004-2005 and it does not examine the changes that happen to those practices over time.

Lin et al. (2006) examine the monitoring role provided by AC in reducing the occurrences of earning restatements, consequently enhancing the quality of financial reporting. The study suggests a negative association between AC characteristics, namely AC size, independence, financial expertise, and earning restatements. Since 2000 was the year that witnessed the main improvements in ACs, the study employ a matched-pair sample of 212 firms based on four-digit SIC code and firm size in the 2000 fiscal year. Earning restatement is measured using a dummy variable equal to 1 if the firm

restated its earnings for the year 2000 and 0 otherwise. Results show that big-sized ACs add extensive oversight over financial reporting and reduce earning restatements. Other AC characteristics such as independence, financial expertise, and meeting proved not to be significant. A longitudinal study on AC practices would provide an important insight into variations happening to AC over time and the reflection of such variations on the quality of financial reporting.

Cohen et al. (2004) provide an overview of the major players in CG (board, AC, external auditors, and internal auditors) and their level of influence on financial reporting quality. The study argues that the interaction between those players and management is essential to effective CG. Moreover, there are external players that influence such interaction such as regulators, legislators, and financial analysts. The study defines the gaps in CG literature and suggests future research that broadens the view of CG for example the oversighting domain of governance to include CSR issues. The previous studies examine the impact of ACs in improving the quality of financial disclosure. This chapter will further examine the impact of effective ACs on enhancing the quality of CSR disclosure.

2.2.2. Other Determinants of Environmental Disclosure

There has been an increased interest in accounting disclosure studies. Some of these studies were based on different theories in examining the impact of corporate social and environmental disclosure. Cormier and Gordon (2001) analyse their study results based on legitimacy theory. The authors argue that disclosing more social and environmental information is related to the firm's need for legitimacy. The study examines three electric utility companies, two publicly owned and one privately owned. Also it uses a quantitative and qualitative measure for the period 1985-1996. The study argues that

legitimacy affects firms more than others depending on their visibility and accountability. Government owned companies are larger in size and politically supported thus they must disclose more information. The study concludes that firms from different ownership structure and size differentiate in their reporting policies. Findings show that publicly owned firms disclose more social and environmental information than privately owned ones.

Another study based on legitimacy theory is done by Wilmshurst and Frost (2000) who examine whether a link exists between factors that affect corporate management decisions to disclose environmental information and the actual environmental reporting practices. According to legitimacy theory, firms need to make sure that their activities are acceptable to society. They need to satisfy stakeholders' demands through environmental disclosure. The study develops a survey instrument on a sample of 105 listed Australian companies for the period 1994-1995 from environmentally sensitive industries. Environmental disclosure is conducted using the content analysis approach and word count-based measure. Results show that respondents do not attach much importance to environmental issues who do not equate the amount of environmental information disclosed. Therefore the results provide limited support to legitimacy theory. However this study concluded on the quantity of environmental information disclosed rather than the quality of information disclosed.

Ness and Mirza (1991) analyse their study on agency theory to determine if any relationship exists between the oil industry and environmental disclosure. Companies were classified into companies from the oil industry and companies form other industries. The study argues that companies in the oil industry disclose more environmental information in their annual reports than other companies since their activities are more damaging to the environment. Using a sample of 131 leading UK

companies in 1984, annual reports, frequencies of disclosures were recorded. Results show positive association between environmental disclosure and the oil industry. Moreover, results are in favour of agency theory and show that when a company decides to disclose more information, it will be for the purpose of increasing management welfare.

Roberts (1992) tested the ability of stakeholder theory to explain corporate social disclosure. The study adopted the framework developed by Ullmann (1985), to explain the link betweeen social disclosure, and social and economic performance. Three dimensions are incorporated and expected to affect the level of corporate social disclosure. The first dimension is stakeholder power. If being socially responsible is a strategy applied by management to statisfy stakeholders, then stakeholder power is positively associated with social disclosure. The second dimension is strategic posture. The company that discloses more in order to enhance their organisational status with its main stakeholders should gain an active social position. The third dimension is the firm's economic performance where it is expected to be positively associated with socially responsible practices.

Roberts (1992) uses scores published by the Council of Economic Priorities (CEP) on 130 firms in the period 1984-1986, and controlled for size, age and industry. Results show that measures of stakeholders' power, strategic posture and economic performance are related to the level of corporate social disclosure. Evidence proves that stakeholder theory is a proper basis for empirical analysis. This study includes three dimensions for predicting corporate social disclosure. However, there are other factors that affect the social responsibility decision making process in the complex nature of the business environment for example managerial strategy to use governance mechanisms and commitment towards CSR issues.

Other studies examining the relationship between the level of social disclosure and firm characteristics are applied to different countries, for example, studies on Australian companies (Trotman and Bradley, 1981), Canadian companies (Cormier and Gordon, 2001), New Zealand companies (Hackston and Milne, 1996), French companies (Déjean and Martinez, 2009), Sweden companies (Cooke, 1989), Hong Kong companies (Gao et al., 2005), Saudi Arabia companies (Alsaeed, 2006) and UK companies (Gray et al., 2001).

Several corporate characteristics have been examined to test their impact on social and environmental disclosure such as corporate size, profitability, listing status and leverage. Gao et al. (2005) investigate the determinants of corporate social and environmental disclosure in Hong Kong by analysing annual reports of 33 Hong Kong (HK) listed companies. The study argues that larger companies disclose more social and environmental information in their annual reports. Moreover, the study argues that the level of disclosure varies in different industries, different sections of annual reports, as well as the content themes of disclosure. The study uses a quantitative measure of content analysis based on word count. Their findings show that company size is significantly associated with the level of corporate social and environmental disclosure. However, the study shows that disclosure level varies among industries where utility companies disclose more corporate social and environmental information than property and banking firms.

Hackston and Milne (1996) examine some potential determinants of social and environmental disclosure in New Zealand companies viz. size, industry type, profitability and country of ownership. The study develops an interrogation instrument to record disclosure in different categories. Annual reports from the largest 47 listed companies on the New Zealand stock exchange were used. Moreover disclosure level

was measured based on sentence count. The study shows that most disclosure practices made by New Zealand companies are more descriptive and related to good news. Also results prove that large companies disclose significantly more social and environmental information than small companies. No significant association was found between profitability and disclosure volume.

Cormier and Magnan (1999) seek to identify determinants of corporate environmental reporting using a cost-benefit framework. Environmental disclosure depends upon benefits obtained due to the decrease of information asymmetry between managers and shareholders. Also it depends on disclosure costs such as reputational, political and contracting costs arising from the actions taken by non-shareholder stakeholders. Such costs affect the firm financial condition. Management tries to weigh costs and benefits resulting from environmental disclosure. The study uses Wiseman's scale to obtain both a qualitative and quantitative measure of environmental information disclosed. Moreover it focuses on a sample of Canadian firms subject to water pollution compliance regulation during the period 1986-1993. Results suggest that firm risk and trading volume is positively related to the extent of environmental disclosure while concentrated ownership is associated with less environmental disclosure. Also firms in good financial condition disclose more environmental information in their annual reports.

Gray et al. (2001) explore the relationship between social and environmental disclosure and corporate characteristics over an eight-year period including size, profitability and industry. They argue that previous studies on the relationship between social and environmental disclosure and characteristics provide mixed results due to a failure to differentiate between mandatory and voluntary disclosure, countries' different disclosure practices, and due to lack of a theoretical basis. The study analysis focuses on

distinguishing between whether disclosure is mandatory or voluntarily, different areas of disclosure such as environment, employees and community, and using eight years' data that was divided into two sets of consecutive four-year periods which allows both cross-sectional and longitudinal analysis. Results show that the relationships between different measures of social and environmental disclosure on the one hand and corporate characteristics on the other vary with both variables used and time period selected. They conclude that the relationship between social and environmental disclosure and characteristics needs intensive researching where other factors need to be integrated such as organisational culture, relation with pressure groups, and media exposure.

Adams (2002) identifies factors that have an impact on the extensiveness, quality, quantity and completeness of disclosure. Firms' reporting practices should enhance accountability which will lead to better performance. Those factors are: (i) corporate characteristics such as size, industry and risk (ii) general contextual factors such as country of origin, time and cultural background (iii) internal organisational factors such as attitude to reporting, change of company chairperson, existence of social reporting committee, and audit. The study argues that previous studies examined social and environmental practices based on main social reporting theories such as stakeholder theory, legitimacy theory and political economy theory. Those studies either supported or rejected one or more of the theories. This essentially depends on the study range and variables included, thus claiming that any one of these theories can only deliver limited explanation.

The findings of Adams (2002) came in favour of all theories of social reporting indicating that all these theories are mutually exclusive. Interviews were conducted with three British companies and four German companies in the chemical and pharmaceutical sector among the largest 400 companies listed in *The Times 1000*

(1995). They were divided into themes; some themes focused on corporate reporting structure and others focused on corporate motives. Findings show that internal factors such as governance structure have an impact on reporting practices. However due to the small sample employed, such a conclusion needs to be taken with care. Therefore, further research examining social and environmental disclosures, governance structure and auditing rules is needed.

In general, most previous studies conclude that the overall degree of association between size and social and environmental disclosure level is highly significant which could be explained by the fact that large companies are highly visible, enjoy diversified portfolio activities and can afford disclosure costs.

Table 2.1

Empirical Studies of Corporate Governance Attributes To Voluntary Disclosures

Author(s) and date	Dependent variables	Independent variables which proved significant	General results	Sample size
Forker (1992)	Share option disclosure	Proportion of independent directors	Positively significant	182 UK quoted firms in 1987-1988
		Existence of AC	Positively significant	
		Board duality	Negatively significant	
Chen and Jaggi (2000)	Financial disclosure	Proportion of independent directors	Positively significant	87 of HK listed firms
Ho and Wong (2001)	Voluntary disclosure	Existence of AC	Positively significant	98 HK firm's respondents to survey in 1997-1998
		Percentage of family members	Negatively significant	
Haniffa and Cooke (2002)	Voluntary disclosure	Chair who is not executive director	Negatively significant	167 Firms listed in KLSE 1995/1996
		Ratio of family members on board	Negatively significant	
		Foreign ownership		
		Ownership diffusion		
		Proportion of bumiputra directors on board	Positively significant	
			Negatively significant	
			Positively significant	
Eng and Mak (2003)	Voluntary disclosure	Proportion of independent directors	Negatively significant	158 listed firms on Singapore Stock Exchange in 1995
		Managerial ownership		
		Governmental ownership	Negatively significant	
		Size		
		Leverage	Positively significant	
			Positive	
			Negatively	
Haniffa and Cooke (2005)	Social disclosure	Board with executive directors	All proved to be positively and significant	139 listed firms on KLSE in 1996-2002
		Chair with multiple directorship		
		Foreign share ownership		
Magena and Pike (2005)	Interim disclosure	AC financial expertise	Positively significant	262 UK listed firms
		AC independency	Negatively significant	

Barako et al. (2006)	Voluntary disclosure	Presence of AC Proportion of non-exclusive directors Institution and foreign ownership	Positively significant Negatively significant Positively significant	54 companies listed on NSE in 2002
Cheng and Courtenay (2006)	Voluntary disclosure	Proportion of independent directors on the board	Positively and significant	115 Firms listed in SGX in 2000
Cerbioni and Parbonetti (2007)	Voluntary disclosure	Proportion of independent directors Board leadership	Positively with quantity and quality of disclosure Positively with disclosure quantity and negatively with disclosure quality	Biotechnological firms listed on the stock market of European countries in 2002-2004
Baek et al. (2009)	voluntary disclosure	Proportion of independent directors Managerial ownership	Positively significant Negatively significant	374 listed companies on S&P 500 in 2000
Mallin et al. (2012)	Social disclosure	Board independence CEO duality Ownership concentration Women directors CSR committee	Positively significant	100 US Best Corporate Citizens 2005-2007

Notes:

Voluntary disclosure: voluntary dissemination of quantitative and qualitative information which exceeds mandatory disclosure requirements, accounting standards, or stock exchange requirements regulations (Watson et al., 2002).

Financial disclosure: the disclosure of financial information in firms' financial statements, i.e. showing the details of income and expenses as well as assets and debts.

Interim disclosure: disclosing information in interim financial reports which permits less information to be reported than in annual financial statements but provides an update to these statements.

Social disclosure: disclosing information relating to employees and consumer issues, community involvement, energy and product safety (Gray et al., 2001).

Share option disclosure: the incomplete or distorted disclosure of information increases the scope of opportunistic behaviour, in the case of share options, these may be granted in circumstances to which shareholders would object had more information been available (Forker, 1992, p.3).

2.2.3. Theoretical Development

CG is concerned with holding the balance between economic and social goals and between individual and communal goals. The CG framework is there to encourage the efficient use of resources and equally to require accountability for the stewardship of those resources (Cadbury, 2003). The aim is to align as nearly as possible the interests of individuals, corporations and society (Cadbury, 2003). ACs can play a key role in providing oversight of risk management. An AC of independent and knowledgeable directors is in a good position to determine not just what management has done to identify the risks, but also what they have done to adequately manage, monitor and control the risks (Keinath and Walo, 2004).

According to the UK Corporate Governance Code 2010, the main role and responsibilities of AC should include reviewing the company's internal control and risk management systems (FRC, 2010). The revised guidance for directors on the Combined Code (FRC, 2005) discusses board committee duties on reviewing the effectiveness of internal control: "The role of board committees in the review process, including that of the AC, is for the board to decide and will depend upon factors such as the size and composition of the board; the scale, diversity and complexity of the company's operations; and the nature of the significant risks that the company faces. To the extent that designated board committees carry out, on behalf of the board, tasks that are attributed in this guidance document to the board, the results of the relevant committees' work should be reported to, and considered by, the board. The board takes responsibility for the disclosures on internal control in the annual report and accounts" (Section Three, No: 25).

Boards around the world are sharpening their focus on social and environmental issues. Many implications arise from anti-social behaviour of a business including the rising costs of related higher energy prices and the impact of climate change policy, damaging firm reputation (KPMG, 2010). From the perspective of risk management and reporting oversight, ACs may have an important role to play in ensuring these issues receive the attention they require. ACs review risks associated with CSR on an annual basis, and monitor performance through the annual control self-assessment process conducted by the internal audit function, and regular meetings with board and CSR committee.

Agency theory states that CG mechanisms and environmental disclosure help reduce agency conflicts and information asymmetry problems between managers and shareholders. Shareholders are the principals in CG and managers are the agents. Boards of directors assign managers who should provide the board with the required information about the firm's activities (Buchholtz et al., 2008). Managers who are engaged in corporate environmental practices could be running these practices at the expense of shareholders. Although agency theory is primarily focused on shareholders' returns and does not engage with risk consequences associated with environmental activities, it views environmental investments as a source of long-term wealth creation to shareholders, and risk reduction to the firm which offsets all costs involved (Salama et al., 2011). Agency theory supports the AC role as a monitoring instrument stating that firms with high information asymmetry and agency costs will be inclined to reduce such costs by providing substantive oversight of financial reporting through audit committees (Collier and Gregory, 1999).

The RBV quality signalling approach builds on the agency approach and the link between competitive advantage and CSR (Porter and Kramer, 2006). Firms with

resource endowments such as greater size that gives rise to scale and scope effects and higher profit provide managers with the resource base to invest in firm-specific competitive advantage generating resources. Competitive advantage investment disclosures refer to those that evidence difficult to replicate investments, and will fulfil that condition where the disclosure is quantitative, specific and therefore audited or auditable. Such disclosures contrast with the vague statements of commitment to environmental protection or 'greenwash' that might be made by competitors unable to afford similar investments. CG and ACs are essential moderators of the relation between resource endowment and disclosure of competitive advantage investment. Audit is specifically important in such relationships for several reasons. First, because auditable or audited figures disclosed in annual reports are more difficult to replicate; engaging in the audit process is an important part of the generation of competitive advantage. Second, firms are more likely to do this when they are able to access relevant expertise and experience, for example where the firm AC comprises suitable professionals. Third, the presence of effective audit as part of the governance structure is more likely to lead to support for CSR investments that are positive NPV.

Management need to look at corporate environmental responsibility practices as a competitive advantage (Salama et al., 2011). Companies might be exposed to financial risks if they fail to manage social and environmental risks (Porter and Kramer, 2006). For example firms investing in clean technology are less susceptible to any increase in energy prices (Salama et al., 2011). Salama et al. (2011) argue that firms that provide the market with information about their environmental behaviour will be able to secure a sustained risk premium.

The study examines the determinants of environmental disclosures in terms of size, prior profitability, AC, and CG mechanisms, substantial ownership, leverage and

industry as control measures. A specific aspect of these tests is that quality and volume of disclosures are contrasted, where the former refers to difficult to replicate disclosures and the latter to generalised, difficult to verify disclosures. Expectations are that the relationship will be stronger for the former than for the latter. It is important to note that disclosure, if measured in an RBV framework, is a proxy for managerial environmental strategy. Such logic follows from the relationship between managerial strategy and competitive advantage. CSR activities and disclosure follows from resource endowments, since without such endowments quality signalling of competitive advantage investments is not possible. Moreover, if a qualitative ranking of disclosures is used based on difficulty of replication, it is likely that disclosures measured thus will be an accurate proxy for managerial strategy. It is also possible that CG corresponds closely to managerial strategy as accounting disclosure is a function of governance and the governance function can serve to enhance firms' reputation.

2.3 HYPOTHESIS DEVELOPMENT

Environmental disclosure, and specifically the quality of environmental disclosure, is determined by the resource base and moderated by CG mechanisms. Quality in the RBV framework specifically relates to the difficulty of replication by competitors (Hasseldine et al., 2005). In prior studies, firm size leads to higher disclosure because large firms are more publicly visible (Watts and Zimmerman, 1978), and therefore subject to greater scrutiny and for similar reasons engage in greater CSR activities (Waddock and Graves, 1997). For both reasons, the volume of disclosures is likely to increase. In the RBV approach, the scale and scope of the firms' operation[1] is also likely to increase the quality of disclosure, as such firms engage in activities that are difficult to replicate from the point of view of competitors. Profitability (PROFIT) is another firm-related factor expected to affect the study model. Firms that possess cash and resources are more likely to be able to invest in difficult to replicate CSR projects. Prior literature suggests that profitable firms are keen to disclose more environmental information to attract investment (Cormier and Magnan, 1999). In the RBV signalling approach, the resource base is measured by prior profitability, which is a proxy for cash flow, and size, measured by natural log of total assets, which is a proxy for the scale and scope of the resource base.

According to the UK Corporate Governance Code 2010, the board should establish AC that must be composed of at least three members; all members must be independent directors with at least one member having relevant and recent financial expertise (FRC, 2010). The Audit Committee Combined Code of Guidance (Smith, 2003) was established to help company boards in making appropriate arrangements for their ACs

[1] Economies of scale is about gaining cost advantage by producing large volume of products and involving in large set of investments whereas economies of scope generates benefits by producing a wide variety of products by efficient use of resources.

regarding responsibilities and meetings. The Report states that "AC should include at least three members who should all be independent non-executive directors" (Smith, 2003). The chairman of AC after discussion with the company secretary sets the number of times meetings should be held and the timing of those meetings; it is required that ACs must meet at least three times a year (Smith, 2003). The work of AC is key to securing stakeholders' confidence in the financial statements of the company; it is a source of strength to the company and to its shareholders (Smith, 2003). ACs review and challenge where needed the actions and judgments relating to significant reporting issues such as the clarity and completeness of disclosure contained within the annual report before submission to the board (Smith, 2003).

The role of AC and its possible impact on enhancing the quality of environmental disclosures has not been investigated in prior literature. Prior CG literature shows that an effective board of directors composes of AC which oversees financial statements, ensures their accuracy and enhances audit quality, and improve financial reporting (Beasley et al., 2009; Cohen et al., 2004). The UK Corporate Governance Code, 2010 recommends that AC be comprised of members with financial literacy and at least one member to be a financial expert (FRC, 2010), and the requirement for such expertise in the face of increasingly complex accounting and auditing information (Abbott et al., 2004; Beasley et al., 2009; Cohen et al., 2004) in assuring the quality of financial reporting (Chen et al., 2006). An AC of independent and knowledgeable directors is in a good position to determine not just what management has done to identify risk, but also what they have done to adequately manage, monitor and control it (Keinath and Walo, 2004). Such expertise enhances the quality and credibility of information provided to the market (Smith, 2003). A number of studies have specifically examined the positive effects of AC characteristics on financial reporting, e.g.Abbott et al. (2004)

and Magena and Pike (2005). In view of this apparent relationship, it is also likely that AC could help in assessing social and environmental responsibility issues when auditing financial reports, e.g. asset values that are subject to environmental concerns and product redesign costs (Dixon et al., 2004). Such an auditing role should help provide reliable information to all stakeholders, enhance the credibility of environmental reports, and build the corporate image (Moroney et al., 2012).

Some previous studies argue that individual CG components do not reflect the governance effects as do the combination of those (e.g. Black et al., 2006; Zaman et al., 2011). Black et al. (2006) construct a CG index for 515 companies listed on the Korean Stock Exchange arguing that individual characteristics do not help governance but combining them in one index does. Zaman et al. (2011) also argue that the interactions of four AC dimensions viz. AC independence, AC financial expertise, AC size, and AC meeting that have been the subject of UK governance codes (Smith Report, 2003; and Higgs Report, 2003) are likely to have to the most impact on AC quality instead of taking them individually.

2.3.1 AC Characteristics

2.3.1.1. AC independence

The existence of AC is associated with error reduction and regulation enhancement (Barako et al., 2006). According to agency theory, the existence of AC reduces agency costs. Independent non-executive directors are the main members of AC. This fact will ensure that information will not be withheld from outsiders hence enhancing internal control and improving disclosure quality (Ho and Wong, 2001). Directors who are independent from management will require that more information be disclosed voluntarily in the firms' annual reports. Studies show a positive association between the

existence of AC that comprise of only independent directors and the extent of voluntary disclosure (Barako et al., 2006; Laksmana, 2008) arguing that ACs provide a substantive monitoring and oversight to financial reporting. Ho and Wong (2001) find a significant and positive association between the extent of voluntary disclosure and AC using Hong Kong firms' data. The study shows that AC of independent directors reduces the amount of information withheld, and consequently improves disclosure quality. The fact that the UK Corporate Governance Code 2010 requires boards to establish AC composed only of independent directors should add an effective monitoring tool over management activities and demand managers to disclosure more information voluntarily in their annual reports.

2.3.1.2. AC meetings

An active AC enhances its effectiveness where members during their meetings oversee financial statements, reassure their accuracy and improve audit quality (Beasley et al., 2009). Frequent AC meetings can be a sign of increased vigilance and monitoring and hence are associated with higher quality and quantity of financial reporting (Chen et al., 2006). Beasley et al. (2009) address some issues linked to AC meetings such as "time spent on important issues, agenda settings, information flow, reliance on management and review of information" (p.69) concluding that meetings could be more effective when ACs probe challenging questions to management and auditor. Previous research suggested the importance of active ACs and found positive association between frequent meetings and higher voluntary disclosure (Beasley et al., 2009).

2.3.1.3. AC financial expertise

The UK Corporate Governance Code 2010 (FRC, 2010) recommends that AC be comprised of members with financial literacy and at least one member to be a financial

expert (FRC, 2010). Blue Ribbon Committee (BRC) defines financial literacy by the ability to read and understand fundamental financial statements (Abbott et al., 2004: p.73). Due to the increasing complexity of accounting and auditing information, the expertise of AC acts as a valuable tool in reducing financial misstatements (Abbott et al., 2004; Beasley et al., 2009; Cohen et al., 2004) and evaluating the quality of financial reporting (Chen et al., 2006)**.** AC expertise enhances the quality and credibility of information provided to the market (Smith, 2003). Abbott et al. (2004) show a positive association between AC financial expertise and financial restatements by examining a set of firms during the period 1991-1999. The study argues that AC internal control prevents or detects material misstatement. Beasley et al. (2009) examine the relation between AC inputs, including independence and expertise, and financial reporting outputs such as restatements and fraud by interviewing 42 AC members serving on US public companies. Results show notable differences in AC members' responses associated with accounting expertise. This supports the argument that auditing expertise enhances reporting quality.

2.3.1.4. AC size

Smith (2003) states that ACs must consist at least of three members. Big ACs receive more legitimacy and authority. It brings a variety of skills, experiences and energy hence increasing the likelihood to resolve potential problems in financial reporting process, and finishing the task in a suitable time (Smith, 2003). They can attain greater power and monitoring practices over the top management team due to the fact that they will enhance the status of internal audit function and its effectiveness (Abbott et al., 2004), thus in turn affecting the amount and quality of information disclosed. Li et al. (2008) find a significant positive link between AC size and intellectual capital disclosure. The study argues that larger size AC is considered as a

powerful monitoring device that is associated with more reliable and higher quality reporting. Magena and Pike (2005) find no significant association between AC size and the extent of disclosure in interim reports in a sample of 262 UK listed companies.

This study will measure the joint effects of AC characteristics in one composite measure (Zaman et al., 2011) and would expect that AC quality will be associated with management disclosing environmental information in its annual reports that have difficulty in replicating nature**.** AC quality is characterized by, audit committee composed of at least three members; all members are independent non-executive directors; at least one member of the AC has financial expertise and finally AC should meet at least three times a year following (Smith, 2003)**.** In combination, the resource base of the firm, and its governance effectiveness, specifically the quality of its audit committee leads to the hypothesis:

H: The quality of environmental disclosure is positively related to the quality of the audit committee.

Much of the literature reviewed above might lead to suppose that there is such a relationship. Insofar as these effects are driven by competitive advantage strategies leading to VRIN assets, or in other words determined by an RBV and quality signalling framework, the expectation is that the hypothesis will be supported for the quality of disclosure but not necessarily for the volume of disclosure.

2.4 METHODOLOGY

2.4.1 Dependent Variable Definition and Measurement

A financial reporting system is considered a basic tool to provide shareholders with the information they need and to assist in communication with stakeholders; such a system can control any managerial manipulation behaviour (Wu et al., 2010). Disclosure is delivered through regulated financial reports including financial statements, footnotes, management discussion, and analysis (Healy and Palepu, 2001: p.406). Corporate disclosure is considered as the main mechanism that helps reduce information symmetry between the company and its stakeholders (Ion, 2008).

Voluntary disclosure can be defined as voluntary dissemination of quantitative and qualitative information which exceeds mandatory disclosure requirements, accounting standards, or stock exchange requirements regulations (Watson et al., 2002). It represents the management's free choice to provide the information needed for the decision making process of those who use the firm's annual reports (Gray et al., 1995). Studies covering voluntary disclosure have increased over the last two decades (for example, Gray et al., 1995; Hossain et al., 1995; Adams et al., 1995; Watson et al., 2002). Academic literature focuses on different types of voluntary disclosure, such as earnings and management forecasts, social and environmental disclosure, CG and share option disclosure (for example, Skinner, 1994; Forker, 1992; Gray et al., 2001; Sun et al., 2010; Laksmana, 2008).

Social and environmental disclosure includes disclosing information relating to employees and consumer issues, community involvement, energy and product safety (Gray et al., 2001). The corporate social responsibility disclosure (CSRD) is defined as "the process of providing information designed to discharge social accountability;

typically this act would be undertaken by the accountable organization and thus might include information in the annual report, special publication, or even socially oriented advertising" (Waller and Lanis, 2009: p.110). Social disclosure represents ways on how an organisation communicates with society and its stakeholders hence legitimising its action. Stakeholders may include shareholders, lenders, suppliers, customers, environmental activists and employees (Elkington, 1994). However, legitimacy could affect some organisations more than others depending on their visibility or their need for political and social support (Cormier and Gordon, 2001).

Corporate environmental responsibility disclosure (CERD hereafter) may be defined as the preparation and provision of information by management on the impact corporate economic activities have on the physical or natural environment in which they operate for the use of relevant stakeholders in assessing their relationship with the reporting entity (Gray et al., 1993). Most studies on environmental disclosure have examined the content of annual reports and proved that environmental discourse varies across companies, countries, industries and time, (for example, Gray et al., 1995; Hackston and Milne, 1996; Gray et al., 2001; Adams, 2002).

Studies on CERD have applied the content analysis technique measuring either the quantity or the quality of information disclosed in firms' annual reports. Krippendorff (1980) defines content analysis as a "research technique for making replicable and valid inferences from data to their context" (p.21). It is important that content analysis replicates the data available by using database structure, checklists and decision rules that will help achieve such a goal (Gray et al., 1995). There have been two widely used measures of content analysis in the accounting literature: quantitative measure and qualitative measure. The quantitative approach focuses on the volume of information disclosed or frequency captured. This approach, also called the mechanistic approach,

was the subject of long debate among researchers mostly centred on the "unit of analysis" whether it is word, sentence, page or phrase. The word is used as a unit of analysis for some studies applying the mechanistic approach (Gao et al., 2005; Campbell, 2003) . It can also be used as a coding unit to resolve the information quality of narrative in disclosure index-based instruments (Campbell and Abdul Rahman, 2010). Words are applicable when each word is weighted for meaning before being included in the narrative, however sometimes words may be part of one or more disclosure categories which would cause double coding (Campbell and Abdul Rahman, 2010). On the other hand, the page is considered a very straight forward technique for detecting the quantity of disclosure but it can only describe one single large category without being able to capture the narrative tangled in subcategories (Campbell and Abdul Rahman, 2010). Also pages may include pictures (graphs, tables) that include no information on environmental activities. In contrast, sentences and words ignore that some important tables or graphs may be related to environmental issues (Al-Tuwaijri et al., 2004).

Studies applying the quantitative approach find that sentences are more reliable as a basis of coding than words or pages, "as natural units of written English which clearly exist between two punctuation marks, sentences are also likely to provide more reliable measure of inter-rater coding than words" (Hackston and Milne, 1996: p.86). However, sentences differentiate in length, style and grammatical choice; in addition one sentence can reflect the information content in more than one category (Campbell and Abdul Rahman, 2010). Finally Campbell and Abdul Rahman, (2010) argue that phrases, clauses or themes are very powerful tools that allow capturing of both meaning and volume of content; they are not constrained by a grammatical unit such as a word, sentence or page but they are groups of words where each forms a theme with a

different meaning. Using themes as a unit of coding helps categorizing the whole narrative without being obliged to allocate meaning by word, sentence or page; hence subcategories captured in a small number of words is efficiently coded (Campbell and Abdul Rahman, 2010).

Mechanistic content analysis studies also capture the frequency of disclosure; those studies apply the benchmark approach that analyses the content of disclosure using a dichotomous categories index (Kolk, 1999). Dichotomous indices measure the frequency of disclosure and give information on a company disclosing, or not, a specific theme. The more complex the indices, the more valuable the data captured (Beck et al., 2010). On the other hand, to assess the objectivity of the mechanistic approach, a number of social and environmental studies apply an empirical tool by adding weights to different quantitative disclosure items based on their perceived importance. Qualifying the importance of each item by giving it a relevant weight is based on survey questions among users groups (Beattie et al., 2004). These studies apply a quality-adjusted quantitative measure by adding a rating or quality score for every sentence or word in the annual report to create an aggregate variable (Hasseldine et al., 2005). However, Beattie et al. (2004) argue that having a large number of items tends to give same results for weighted and un-weighted items.

While the quantitative approach using volume or frequency-base data is limited in its ability to designate content and trends (Campbell and Abdul Rahman, 2010), the qualitative or the interpretative approach focuses on the narrative of every theme being analysed. It is considered as more reliable and descriptive to stakeholders (Al-Tuwaijri et al., 2004). To gain a better understanding of its meaning and the richness of that meaning, the qualitative approach tends to give various ratings to different levels of social responsibility disclosure (Beck et al., 2010). A study by Robertson and Nicholson

(1996) reveals a hierarchy of three levels of social responsibility disclosure, i.e. corporate rhetoric, specific endeavour and implementation and monitoring. The hierarchy of importance gives low rate to “non-quantified information” and high rate to extremely monitored social information. Toms (2002) developed a rating scale for social disclosure where he gives a (0) score to non-disclosure (1) to general information, (2) to special endeavour, policy only, (3) to specified policy, (4) to implementation and monitoring, and (5) to implementation, monitoring and publication of results.. Table 2.2 summarizes some social and environmental studies according to the content analysis measure used.

Table 2.2

Prior Studies on Social and Environmental Disclosure Applying Different Measures

Research paper	Research contribution	Content analysis approach/ tool
Wiseman (1982)	Relationship between environmental disclosure content and environmental performance	Quantity with quality/ 18 index items classified into 4 categories
Harte and Owen (1991)	A look at the development of green reporting by British companies	Quantity/ dichotomous disclosure index
Ness and Mirza (1991)	The relationship between environmental disclosure and the oil industry based on agency theory	Quantitative/ frequency of disclosure based on prior framework
Patten (1991)	Examining whether public pressure or firm profitability is behind firm's decision of disclosing social information voluntarily	Quantitative/ pages counts and categories classified based on Ernst & Ernst (1978)
Roberts (1992)	The explanation of social responsibility disclosure based on stakeholder theory	Quantity with quality/ CEP ratings (measure of both level and reliability of CSR disclosure
Gray et al. (1995)	Constructing a research database of social and environmental reporting by UK companies	Quantitative/ Guthrie's approach based on Ernest & Ernest database
Hackston and Milne (1996)	Examining some potential determinants of social and environmental disclosure in New Zealand companies	Quantitative measure/ sentence-based coding instrument
Kolk (1999)	An evaluation of environmental rating system	Quantitative/UNEP, sustainability rating survey
Milne and Chan (1999)	Investigating the impact of narrative social disclosures in the annual reports on investment decision making	Narrative textual disclosure/ investment decision experiment using survey questions
Milne and Adler (1999)	A study of inter-coder reliability of environmental disclosure content analysis	Quantitative/ based on (Hackston and Milne, 1996) instrument
Wilmshurst and Frost (2000)	A link between the importance of specific environmental disclosure issues and actual environmental reporting	Quantitative/ sentence count
Cormier and Gordon (2001)	Relationship between company disclosure, size and ownership	Disclosure index based on (Wiseman, 1982)
Gray et al. (2001)	Exploring the relationship between social and environmental disclosure by large companies and corporate characteristics	Quantitative/ content analysis employed in the CSEAR database (data are collected by volume categorized by subject)

Milne and Patten (2002)	The legitimized impact of environmental disclosure provided in chemical firms' annual reports on investors	Narrative/ investment decision experiment based on (Milne and Chan, 1999)
Toms (2002)	Relationship between environmental disclosure and environmental reputation	Quantitative measure/ quality signalling based on the volume of information
Campbell (2003)	The UK environmental disclosure as a mechanism of legitimating	Quantitative/ word count
Al-Tuwaijri et al. (2004)	An analysis of the interrelation among environmental disclosure, environmental performance and economic performance with a joint determination of the three functions	Quantitative/ dichotomous scoring index
Hasseldine et al. (2005)	The impact of environmental disclosure on environmental reputation	Qualitative measure with weights/ based on (Toms, 2002)
Perrini (2005)	Corporate social responsibility themes and topics among European companies	Quantitative/ sentence count with checklist instrument classified into 8 stakeholders-based categories
Gao et al. (2005)	Examining the determinants of social and environmental disclosure in Hong Kong	Quantitative/ word count
Sun et al. (2010)	The association between corporate environmental disclosure, earning management and the impact of CG on that association	Quantitative/ Environmental Key Performance Indicator (KPI) required by UK government
Dhaliwal et al. (2011)	Voluntary nonfinancial disclosure and the cost of equity capital: The initiation of CSR reporting	Disclosure index based on different categories of CSR issues employed by KLD

From Table 2.2, it is noteworthy that most environmental and social disclosure studies focus on the quantitative technique rather than the interpretative technique proving the fact that the majority of empirical studies that have been done on social and environmental disclosure captured the volume of information disclosed without giving an account of the significance of this information or the completeness of company disclosing environmental disclosure practices (Beck et al., 2010).

This study will examine the effects of AC on environmental disclosure by adopting a method that has been outlined in Beck et al. (2010). The CONI approach measures information diversity, content and volume. It involves dual qualitative and volumetric

measurement. Beck et al. (2010) applies the CONI instrument to a matched sample of 14 pairs of companies from the United Kingdom and Germany over a five-year period. Findings show that information diversity has broadened over time, however in terms of information content, there is supremacy of narrative disclosure over numerical disclosure with little narrative, quantitative and comparable disclosure.

This study will extend Beck et al.'s (2010) work by using the CONI research instrument in analysing environmental disclosure of a sample of UK FTSE 350 companies. The study will add to the academic literature being the first that applies the CONI research instrument in other area of disclosure studies that is the association between environmental disclosure and CG mechanisms within the British context. The CONI approach has an advantage over other content analysis approaches by the ability to capture both the mechanistic and the interpretative measures of content analysis instead of applying them separately (Beck et al., 2010). Beck et al. (2010) state that "a perfect content analysis instrument would be to capture the totality of meaning from a narrative and convey this in a coded numerical form" (p.218). CONI is based on dual qualitative and volumetric measurement which gives it an advantage over an index-based meaning oriented analysis in that the latter does not combine the meaning with disclosure volume (Beck et al., 2010).

CONI applies a matrix instrument that captures all information disclosed and gives it a scale that will allow a qualitative analysis of disclosure based on Wiseman (1982). This instrument is divided into 12 categories that include subcategories which make it easier to measure the data analysed. This variety of categories helps in capturing the totality of environmental reporting, decreasing double coding and drawing conclusion about the studied firms (Campbell and Abdul Rahman, 2010). Categories were

established by analysing previous literature for common patterns and themes (see for example Cormier and Gordon, 2001; Wiseman, 1982)

Categories adopted from Beck et al. (2010) are:

1. General environmental-related disclosures including aims, any mention of long-term policy, and results resulting from that policy.
2. Information related to who is responsible for implementation of policies such as top management or board, committee and audit.
3. Pollution-related disclosures including air, water and land emission, and actions undertaken. It also includes information about waste reduction, recycling, and product development.
4. Disclosure related to sustainability and firms' commitment to the United Nations Conference on Environmental Development (UNCED).
5. Environmental liabilities related to financial disclosure.
6. Environmental activities including staff training, awards, sponsorships, and project involvement.
7. Business-related risks associated with environmental behaviour, costs involved, and procedures adopted to mitigate these risks.
8. Pressure groups such as shareholders, government, and other stakeholders.
9. The availability of separate environmental reports referenced within annual reports.
10. Energy-related disclosures including energy conservation, energy saving programmes, and alternative energy sources.
11. Feedback received from stakeholders.

Categories are explained in Appendix1 and adopted from Beck et al. (2010). A reliability test was run by coders with different experience and academic base in content analysis and environmental disclosure issues.

There are three types of reliability testing (Krippendorff, 1980). The first type is the stability test referring to the ability of the coder to agree with herself/ himself over time. The second type involves running two kinds of testing, i.e. reproductivity testing that is achieved due to an agreement between two coders, and replicability testing occurring when multiple groups of coders apply a coding theme reliably (Rourk et al., 2000). This type of reliability measurement is also called inter-coder reliability; it helps in assisting with the constancy of coding decision (Beck et al., 2010). The final test is the accuracy test of coding performance against a predetermined standard set known from previous studies and experiments (Milne and Adler, 1999).

The study applies the most commonly used measure of reliability which is the inter-coder reliability test considering that stability test does not give sufficient results and accuracy test rarely exists (Beattie et al., 2004). The alpha coefficient of agreement is used to measure reliability: "it is the ratio of the number of pairwise inter-judge agreement to the total number of pair wise judgements" (Milne and Adler, 1999: p.240). It has been argued that the smaller the number of coding categories, the higher the probability of getting random agreement in coding decisions; hence the alpha coefficient will give overestimated results (Milne and Adler, 1999; Beattie et al., 2004). The study includes a large number of coding categories; therefore the alpha coefficient of agreement should be applicable. The alpha co-efficient was calculated according to the method outlined by Krippendorff (1980). Krippendorff alpha value of 87.8% was achieved.

This study will be the first that applies the CONI approach on the most recent period of 2007-2011. This will help explain the UK firms' concentration on environmental issues and the "going green" concept. Managers may need to increase their attention to environmental issues especially after the announcement by the UK government stressing the significance of many elements of social and environmental reporting (Sun et al., 2010). The location of environmental disclosure might take different sections of the annual reports. Companies disclose environmental information within the business review or reporting and financial review in annual reports and accounts (Sun et al., 2010). It could be located in the chairman's statement and director's report, but most importantly in the CSR report. Some companies also publish stand-alone reports, however these reports will be excluded from this study following the work by Beck et al. (2010) arguing that most vital information will still be found in the annual reports.

The CONI approach consists of three steps according to Beck et al. (2010):

Step 1- coding content diversity: instead of capturing the relevant meaning by words, sentences or paragraphs, the study analyses the narrative of firms' annual reports at the phrase level which will help coding the totality of meaning.

Step 2- coding on information content quality: the level of information provided will be combined with the depth of disclosure based on five types:

- Type1- a pure narrative disclosure such as issues related to categories definition.
- Type2- a pure narrative disclosure with more details related to disclosure in each category.
- Type3- quantitative disclosure addressing issues related to categories mentioned in Appendix1.

- Type4- quantitative and qualitative disclosure of the categories.
- Type5- quantitative, qualitative and comparable disclosure.

Step3- volumetric measurement: number of disclosure items per category using phrase counts which helps to indicate the importance of each category of disclosure to the company.

The qualitative measure is based on testing type (1-5) disclosures as thresholds as a measure of disclosure quality. Each company is scored with reference to its highest ranking phrase where scores are given to the highest level observed not the level that has the highest frequency.

2.4.2 Sample Selection

All companies that were continuously listed in the UK FTSE 350 in the period 2007-2011 inclusive were selected as the initial sample. This created a balance panel with five years' data per company. The study's sample represents the top 350 UK-listed firms by total market capitalisation which guarantees both a wide range of data available and statistical power in the tests. Elimination of companies with missing data reduced the sample size to 224 firms in each year with a total firm/year sample size of 1120 observations. The final sample size is among the highest compared to prior literature in the area of disclosure practices which should add reliability to the study findings. The study uses up to date data; the most recent data at the time of the conducted study (2007-2011). This will help to capture the increased and most recent awareness of CG and reporting practices. The annual reports, for five years 2007-2011 for each firm in the sample, will be selected as a primary source for environmental responsibility disclosure. These reports are our basic data source for environmental disclosure and CG information since they are publicly available, produced regularly,

management implement editorial control over them, and finally they have been used as a basic source in previous research (Wilmshurst and Frost, 2000). Financial data related to firms' specific characteristics will be collected from *DataStream*.

2.4.3 Independent Variables Measurement

The resource base is measured using firm size which is the natural log of total assets (SIZE). It is a proxy of the extent of information costs. Disclosing information voluntarily by large companies incurs slight costs comparing to the costs that would be associated if shareholders needed to collect their own information about the firm (Cormier and Magnan, 1999). Large companies tend to disclose more information voluntarily since they are highly visible and exposed to higher agency costs (Alsaeed, 2006). Legitimacy theory also supports the fact that large companies are more visible and they need to disclose more depending on the fact that those companies are involved in more activities with a substantial influence on society; some of them might dominate the market (Cormier et al., 2004; Cormier and Gordon, 2001). Other studies also suggest that large companies sometimes attempt to reduce political costs that may affect negatively on the management prosperity by disclosing more social and environmental information (Hackston and Milne, 1996). For all previous reasons mentioned, the volume of disclosure is likely to increase. In the RBV approach, firm size is likely to increase the quality of disclosure as such firms own the resources that lead them to engage in CA inimitable activities.

Profitability measured by return on equity (ROE) is another resource base factor[2]. Shareholders require the firm to disclose environmental information related to operating

[2] For comparability analysis with Toms (2002) and Hasseldine et al. (2005), ROE was used as a measure for profitability. Other measures such as return on asset (ROA), and return on capital employed (ROCE) were also used and results were consistent.

costs and capital disbursement, environmental management plans, and environmental obligations (Cormier and Magnan, 1999). The fact that environmental disclosure is costly makes it influenced by the firm's financial health. Profitable firms can endure stakeholders' pressure and afford the costs incurred from environmental disclosure when facing environmental problems (disclosing bad news) (Cormier and Magnan, 1999). On the other hand, they are keen to disclose more environmental information to the public to attract more investors and publicise their environmental friendly performance (good news, such as environmental awards). These firms will gain credibility among all environmental groups as reliable and socially responsibility companies (Cormier and Magnan, 1999), also increasing investors' confidence which in turn will increase management compensation (Ahmed and Courtis, 1999). While firms suffering financial problems may feel that disclosing more social and environmental information in their annual report will not work in favour of their critical financial position, i.e. managers could be subject to corporate actions when the firm continues to perform poorly in the market, hence a decision of disclosing more will be threatening (Cormier et al., 2004).

According to the RBV view, the study specifically aims to test the hypothesis that ex ante resources lead to strategies that must be disclosed in order to be valorised in the form of CA investment and hence superior reputation. Lagging ROE provides a test of this hypothesis and mitigates modelling issues which tend to confound analysis of the link between financial performance and higher disclosure that leads to superior reputation (Ullmann, 1985).

CG has been recognised as an essential mechanism in monitoring managers' behaviour and facilitating their actions for the purpose of maximising the value of the company (Cheng and Courtenay, 2006). CG is about the governance of corporations and

the activities they are engaged in (Brown et al., 2011). The Cadbury Committee 1992 set the first version of the UK Code "best practice" on CG. Researchers in CG often use the Cadbury Report as a starting base (Brennan and Solomon, 2008). CG is defined as the system by which companies are directed and controlled (FRC, 2010). According to the Corporate Governance Code (2010), the board of directors' role is presented through evaluating the company's position and projections while the shareholders' role is to choose the auditors and directors that should form governance. Similarly, the AC is expected to check the financial statement of the company and review any related financial reporting judgements (FRC, 2010). Finally, CG can play a wider role, "holding the balance between economic and social goals and between individuals and communal goals. The CG framework is there to encourage the efficient use of resources and equally to require accountability of the stewardship of those resources" (Buchholtz et al., 2008: p.327). This will help in fulfilling the goals of individuals, firms and society.

The study aims to examine audit committee contribution above that provided by board of directors on environmental disclosure. AC quality is measured in composite fashion to reflect compliance with the recommendations of the Smith Report (2003). Compliance indicated where all committee members are independent-non-executive directors, there are three or more meetings per year, there is at least one committee member with financial expertise and the committee size composed of at least three members. In addition to the composite measures, AC individual components are also used separately to examine their individual contribution.

2.4.4 Control Variables

The mediating effective role of the board is measured using a series of mainly count and dummy variables.

Board Size: The UK Corporate Governance Code suggests that board size should comprise of an appropriate range of members. Prior studies discuss agency problems resulting from the separation of management and control and the role that the board can play in reducing agency costs (Jensen, 1993). Proponents of agency theory argue that larger boards may be more independent of management, and thus will be linked to a better firm performance where firms are expected to pay more attention to environmentally friendly activities (Halme and Huse, 1997). Halme and Huse (1997) state that "in the case of a large board, there is a higher probability of a broader range of stakeholders and multitude values to be presented than if the number of board members is small" (p.142). Proponents of stewardship theory argue that smaller in size boards endure involvement and social decisions hence better decision making (Muth and Donaldson, 1998). Board size is measured by the number of board members.

Board independence: This is defined as the proportion of outside directors to the total number of directors. Agency theory states that more independent directors on the board helps increase monitoring and control of managers' actions due to their opportunistic behaviour which will lead to a reduction in agency costs (Fama and Jensen, 1983). Previous studies argue that the firm's selection of a greater number of independent directors signals its interest in legitimacy and the external environment, hence showing more interest in environmentally friendly activities (Arora and Dharwadkar, 2011). Stewardship theory states that executive directors provide expertise and create sources of communication needed for effective board functioning (Muth and

Donaldson, 1998). Some argue that a vast majority of independent directors are hired for their financial expertise, a fact that will make them more inclined to evaluate firms' historical financial information rather than uncertain long-term investments such as corporate environmental responsibilities activities, R&D investments and internal innovation (Arora and Dharwadkar, 2011: p.138). Since independent directors are appointed to protect shareholders' interests, they might consider that engaging in corporate environmental responsibility activities is not in the firm's interest due to their uncertain returns. Moreover, firms might appoint non-executives to specifically cover CSR briefs (Arora and Dharwadkar, 2011).

Cheng and Courtenay's (2006) results show a significant and positive association between the proportion of independent directors and voluntary disclosure on a sample of 104 firms listed on the Singapore Stock Exchange in 2000. Chen and Jaggi's (2000) results show a positive association between the proportions of independent directors and the quality/extent of financial disclosure. Studies that are in contrast with high proportions of independent directors on board (Barako et al., 2006; Haniffa and Cooke, 2002) based their argument on the assumption that independent directors may lack both real independence from management and inside business knowledge; also they may bring excessive monitoring (Haniffa and Cooke, 2002). A significant negative relationship between board independence and voluntary disclosure was proved by Eng and Mak (2003), Barako et al. (2006) and Ho and Wong (2001). Lim et al. (2007) examine the effects of board composition on non-financial disclosure; this includes social and environmental disclosure. Their findings show no significant association between the two.

Board meeting: This refers to the number of times that the board of directors meets during the year. It is one of the essential board duties that will allow sharing and

oversighting of financial information among directors; that fact should add more transparency and quality to information reporting practices and enhance the effectiveness of board decisions (Carcello et al., 2002). A study by Laksmana (2008) finds a positive association between board meetings and disclosure quality.

Board Duality: This means that one person is holding the chair of board of directors and CEO positions. Agency theory supports the view that the separation of the two roles, that is the absence of role duality, increases internal control of companies and provides a rigorous monitoring policy for the firm to reduce information asymmetry (Watts and Zimmerman, 1990). This separation of the chairman and chief executive would increase the need for disclosure (Barako et al., 2006). On the other hand, it has been argued that the existence of role duality would enhance the domination effects of the CEO over the board hence improving the board effectiveness by controlling the selection process of other board members (Barako et al., 2006). The CEO may feel bound to the firm future performance because of long-term employment (Muth and Donaldson, 1998). Some studies show that no significant relationship exists between role duality and voluntary disclosure (Ho and Wong, 2001; Barako et al., 2006). Forker (1992) argues that combining the roles of the chair executive and the chairman affects negatively on monitoring value which will consequently affect the quality of disclosure. Cerbioni and Parbonetti (2007) also find positive association between board leadership and quantity of information disclosed. Board duality is a dummy variable that takes the value of one in case of duality and zero otherwise.

Board diversity: The correlation between CG and CSR may be related to board diversity. Board composition consists of board independence and leadership, membership criteria, and directors qualifications and nomination process (Buchholtz et al., 2008). It should also highlight the issue of diversifying the board to include more

women. FTSE 350 companies have been encouraged to promote greater female representation on boards (12.5%) after the publication of the Davies Report "Women on Boards" in Feb 2011. The Davies Report states that diversifying the board with the best people from a range of perspectives and backgrounds should help improve business performance and promote equal opportunities for women (Davies, 2011). Ramirez (2003) argues that diversifying the board would broaden the decision making process and prevent the group thinking dynamics that share the same ideas, experiences and features. Dallas (2001) argues that board diversity stresses the firm's principles in ethical and social responsibility issues. He finds that diversifying the board improves negotiations, counter argument and the decision making process. Francoeur et al. (2008) examine gender diversity and the impact of an increased number of women in governance systems on firm performance. The results show that firms with a higher proportion of women on the board and top management positions generates positive and significant abnormal returns. Board diversity is measured by the number of women on the board.

Prior literature indicated the potential importance of further variables that were added as controls.

Substantial ownership: This is measured by the percentage of outstanding common shares (5% or more) held by substantial shareholders who are unaffiliated with management. The separation of ownership and control causes a conflict of interest between shareholders and management. This fact will lead to higher agency costs since it is expected that outside shareholders will increase monitoring of managers' behaviour hence increasing monitoring costs. However, those costs can be reduced by disclosing additional information voluntarily such as social and environmental information (Halme and Huse, 1997; Eng and Mak, 2003). Managers would expect that such action will help

compensate for the agency problem and that the cost of non-disclosure is higher than the cost of disclosure (Watts and Zimmerman, 1990). Scholars in contrast with the previous argument argued that the annual report is not the only major element to solve monitoring problems between managers and shareholders. Thus when ownership is diffused, disclosing more information within the annual reports will not be sufficient to monitor managers' behaviour (Raffournier, 1995). Some studies show a positive association between voluntary disclosure and substantial ownership (Barako et al., 2006; Haniffa and Cooke, 2002). Other studies show negative association (Raffournier, 1995), and there are also studies that show no significant association between substantial ownership and environmental disclosure (Halme and Huse, 1997).

Leverage: Companies' activities are funded from a mixture of debt and equity. Companies with high leverage ratio have an incentive to disclose more information to satisfy creditors' need of information. Creditors usually request more information to be disclosed before making any confirmed decision (Naser et al., 2002). Firms with higher debt need to disclose more information to assure creditors that they are in a good position and that they will attain their obligations towards them. Highly leveraged firms incur monitoring costs, so they tend to reduce such costs by disclosing more information in firms' annual reports (Ahmed and Courtis, 1999). Previous studies come up with mixed results regarding the association between leverage ratio and the level of disclosure. The findings of Naser et al. (2002) and Hossain et al. (1995) show a positive association between leverage ratio and the level of information disclosed while Wallace et al. (1994) observe no significant relationship between leverage ratio and disclosure level.

Industry Distribution: The final control variable is the allocation of the sample to industry groups using the *DataStream* Industry Classification Benchmark (ICB) Level 1

industries. This creates ten industry groups that reflect the differing exposure of firms to environmental issues.

2.4.5 Model Specification

To test the study hypothesis, the following model was used:

$$ENDISC = \beta_o + \beta_1 SIZE + \beta_2 ROE_{t-1} + \beta_3 ACQUAL + \beta_4 BODVAR + \beta_5 SUBOWN + \beta_6 LEV + \beta_7 INDUSTRY + \varepsilon$$

Where:

ENDISC = environmental disclosure aggregate score measured using CONI approach. Two measures were used. First, QUALDISCQ, which is the highest recorded level achieved in step 2 of the CONI typology. Second, VOLDISCV, which is the volumetric measure used as a proxy for total disclosures according to step 3 of the CONI approach.

SIZE = natural log of total assets

ROE_{t-1} = prior year return on equity

ACQUAL = 1 [if all AC members are independent non-executive directors and ACMEET ≥3, and ACEXP ≥1, and ACSIZE ≥3], otherwise = 0

BODVAR = board characteristics including: BODSIZE = number of board members; BODMEET = number of board meetings held during the year; BODIND = board independence [proportion of independent non-executive members on board] BODDUAL = status of board chair [chairman and chief executive = 1, otherwise = 0]; BODDIV = proportion of women on board.

SUBOWN = total percentage of shares held by substantial shareholders (5% or more)

LEV = debt to assets ratio

INDUSTRY = industry classification

ε = error term

β_0 = intercept

β_1 - β_{15} = coefficients

2.5 EMPIRICAL ANALYSIS AND RESULTS

2.5.1 Introductory Findings

Figure 2.1 illustrates the number of disclosures per category and year. Thematic analysis using CONI showed an increasing pattern in disclosure practice over a five-year period, specifically disclosures related to pollution and energy. The theme related to pollution disclosure rounded up to 24% of the volume of information disclosed in 2011, and 31% in 2010 as measured by an aggregate phrase count per category[3]. The large increase in pollution disclosures in 2010 reflects the increasing awareness in the management of UK firms of the strategic importance of the natural environment after the BP oil spill natural disaster in April 2010 causing the company to trade at 20% discount to its rival, Royal Dutch Shell (De Villiers et al., 2011).

The oil spill phenomenon in the Gulf of Mexico led to voting against BP's reports and accounts by a global coalition of fund managers due to risk management flaws. Their vows agreed that the annual report of BP does not provide shareholders with sufficient details to determine how the company's safety and risk management system has been evaluated, managed, and mitigated, and how the oversighting role of the board and its sub-committees has been strengthened (Kendall, 2011). This case illustrates that environmental issues can result in billions of dollars in clean-up costs, fines and settlements for implicated firms if not assessed, managed and measured sufficiently (De Villiers et al., 2011). Therefore, good environmental performance is a good tool to reduce firms' risks and attract investors, which explains the increasing trend in disclosure practice related to pollution in 2010.

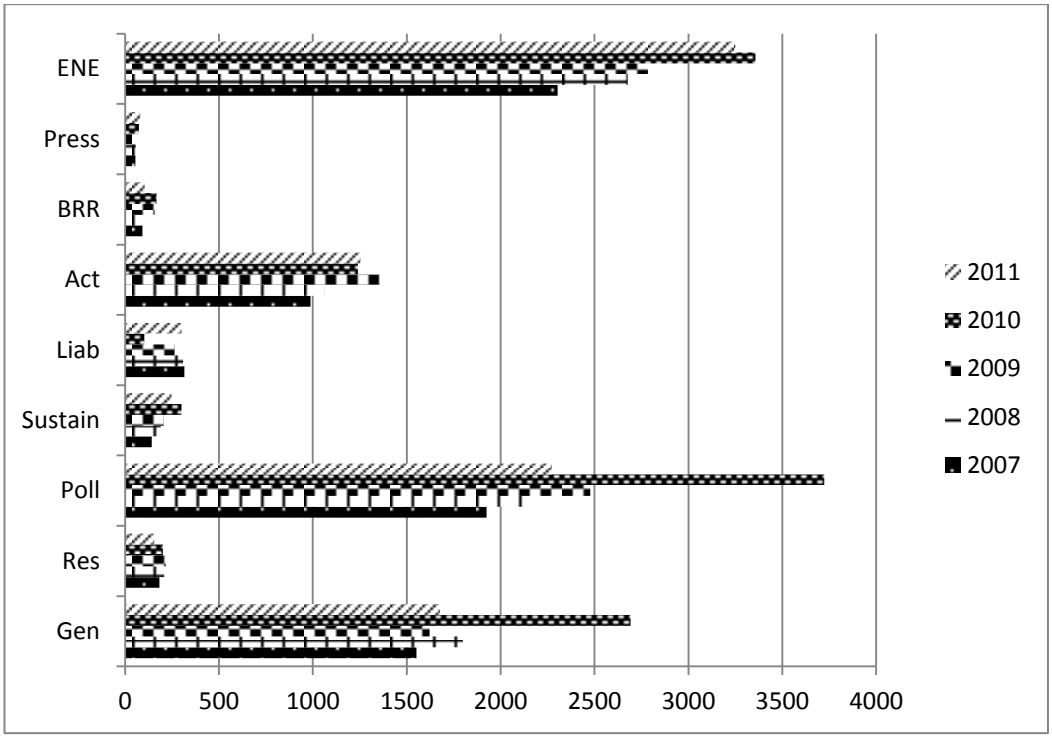
[3] Categories SER and IRP were merged with GEN category due to the scarcity of information disclosed in a large number of sample firms' annual reports.

The theme related to energy disclosure rounded up to 34% of the volume of information disclosed in 2011, and 28.3% in 2010. The cost reduction related to energy saving programmes and exploration of alternative energy sources required firms to disclose such behaviour in their annual reports, especially that environmental efforts will help increase competitive advantage and improve investor financial returns (Hassel et al., 2005).

Overall there is an increasing trend in disclosures categories recorded by CONI over the five-year period which help to capture the diversity of information disclosed. However, disclosure in these categories is measured based on volumetric measurement, i.e. an aggregate phrase count. It has been argued that the volume itself could be used by firms to improve their corporate image or it could be a mere narrative that does not reflect real commitment of firms towards environmental matters. The volume in voluntary non-regulated disclosures could be merely descriptive, self-congratulatory, and therefore less reliable (Toms, 2002).

Figure 2.1

Number of disclosures per category 2007-2011



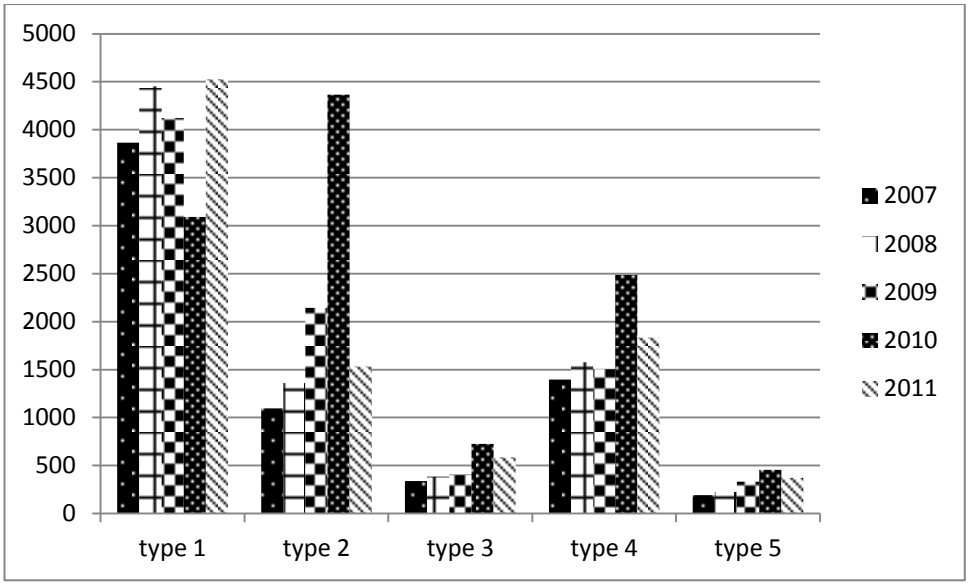
2.5.2 Disclosure Content

In order to establish whether there is any significant increase in disclosure content, Figure 4 illustrate the disclosure volume per quality type. Overall, there is an increase in disclosures over the five-year period. An increase in Type 1 and Type 2 disclosures in 2011 and 2010 indicates a trend towards more company-specific and detailed reporting on environmental issues. Moreover, there is a significant increase in Type 3 and Type 4 disclosures in 2010 and 2011 over previous years reflecting a trend towards more transparency and accountability in reporting, given an increase in numerical and potentially audited information (Beck et al., 2010: p.216).

In RBV and indeed CONI language, numerical information captures the real commitment of firms towards the environment that is difficult to replicate by others unless they are engaged in investment at similar level of environmental impact. Although the graph shows that the majority of disclosures were made purely in a narrative from Type 1 and Type 2 level, the qualitative measure applied in this study is based on the highest scaled phrase observed rather than the frequency of phrases. Over the five-year period of the study, the appearance of Type 3, Type 4, Type 5 disclosures has increased. Therefore, it is safe to conclude that the quality of reporting is improving over time.

Figure 2.2

Disclosure Content per Type (1-5)



2.5.3 Descriptive Statistics

Table 2.3 presents the descriptive statistics for CERD, resource base variables, AC quality and AC individual variables, board variables and control variables. Continuous variables, i.e. ROE, SIZE, SUBOWN and LEV, demonstrate significant non-normality as a function of the outlaying observations which were dealt with by winsorising in the tests below. The mean (median) for environmental disclosure volume score is 40.04 (33). It ranges from 0 minimum score to 243 maximum score. The mean (median) of qualitative disclosure score is 3.177 (4), and it ranges from 0 minimum score to 5 maximum score. These variations in environmental disclosure scores among the sample firms during the five-year study period (2007-2011) indicate that some companies show more interest than others in disclosing information about their environmental practices within their annual reports; also the importance of corporate environmental responsibility issues has increased over the years.

Of the resource base variables, the mean firm size measured by natural log of total assets (SIZE) is 14.76 and it ranges from 7.11 minimum score to 21.59 maximum score indicating that our sample is composed of both large and small firms, and the mean profitability measured using ROE is 34.1%. With respect to AC characteristics, the mean for AC independence (ACIND) is 94.2% and the median is 1 which indicates that compliance with the UK CG code is high. AC meets on average four times a year. The mean for AC size (ACSIZE) is 3.78 and the median is 4. The mean percentage of AC members with financial expertise (ACEXP) is 39.7% indicating that almost 40% of companies are complying with UK Corporate Governance Code 2010 (FRC, 2010). It is noteworthy that the mean for AC quality (ACQUAL) is 0.839 which is higher than the equivalent figure of 0.16 applied to a sample of UK FTSE 350 companies between

2001-2004 inclusive (Zaman et al. (2011), demonstrating the changes brought about by the Smith Report (2003) recommendations.

With respect to board characteristics variables, the mean percentage of non-executive directors on board (BODIND) is 66.6% which means that more than half of the board members are independent as defined in the UK Code 2010. This figure is higher than the findings of Zaman et al. (2011) which show that 58% of board members are independent for a sample of UK FTSE 350 and lower than Laksmana's (2008) findings which report that 79% of board members are independent for a 2002 sample of US firms. This can be explained by the mandatory settings of CG adopted in the US. The mean average number of members on boards (BODSIZE) is 9.372, lower than the average mean of 11.33 and 12.02 for 2002 and 1999 US sample firms reported by Laksmana (2008).

The mean number of board meetings (BODMEET) is 8.444 which is close to the findings of Zaman et al. (2011) who report an average of 8.78 meetings for their UK sample, and Laksmana's (2008) study which shows a mean number of board meetings of 8.74 for her US sample firms. This indicates that the frequency of board meetings in the UK and US are similar. Only 2.5% of the sample companies have the chairman and chief executive role combined (BODDUAL) meaning that 97.5% of companies have no duality role. The percentage mean of board diversity (BODDIV) is 9.19% indicating that few women directors currently sit on boards. However, this figure is higher than the findings of Francoeur et al. (2008) of 7.02% average representation of women directors of a sample taken from the 500 largest Canadian firms (FP500). Finally, other controls show a mean percentage of substantial shareholdings (SUBOWN) of 25.4%, which is lower than the mean of 62% blockholder ownership reported in Eng and Mak (2003), and the mean of 44.6% reported by Chen and Jaggi (2000), and a mean of leverage

(LEV) of 23% indicating that debt represents a substantial portion of sample firms' capital structure.

Skewness and kurtosis test for normality assumption. Specifically, the skewness measures the symmetry of distribution while kurtosis measures the flatness or peakedness of the distribution (Hair et al., 2010:35-36). Data is considered normal if skewness is within ±1.96 and kurtosis is within ±2. It can be seen from Table 2.3 that both skewness and kurtosis for some variables show high values, and therefore are not normally distributed. Since most variables do have a problem related to skewness and kurtosis, the study tends to fit the data by transforming independent variables using natural logs; in addition to that, the study applies winsorising of continuous variables as a function of outlying observations.

Table 2.3- Descriptive Statistics for Dependent and Independent Variables

Variables	Mean	Median	Std. Dev.	Min	Max	Skewness	Kurtosis
VOLDISC	40.04	33	35.84	0	243	1.779	7.228
QUALDISC	3.177	4	1.54	0	5	-0.528	1.779
SIZE	14.769	14.439	1.801	7.109	21.59	1.006	5.404
ROE	0.341	0.153	2.304	-1.61	72.06	26.63	812.81
ACQUAL	0.839	1	0.367	0	1	-1.851	4.427
ACSIZE	3.781	4	0.935	2	7	0.947	3.75
ACIND	0.942	1	0.184	0	1	-3.386	13.792
ACMEET	4.23	4	1.655	1	17	2.079	11.134
ACEXP	0.397	0.333	0.236	0	1.25	1.371	4.337
BOARDSIZE	9.372	9	2.760	3	21	0.501	3.484
BOARDIND	0.666	0.667	0.144	0	1	0.501	3.484
BOARMEET	8.444	8	3.016	1	33	1.803	10.753
BOARDDUAL	0.025	0	0.158	0	1	5.974	36.693
BODDIV	0.091	0.091	0.094	0	0.5	0.872	3.54
SUBOWN	0.254	0.220	0.186	0	0.99	1.146	4.525
LEV	0.229	0.194	0.234	0	5.268	8.938	185.448

VOLDISC = total environmental phrases per coded category using CONI method; **QUALDISC** = qualitative measure of disclosure based on 5 types in CONI; **ACQUAL** = 1 [if all AC members are independent non-executive directors and ACMEET =>3, and ACEXP =>1, and ACSIZE =>3], otherwise =0; **ACSIZE** = number of AC members; **ACIND =** proportion of independent non-executive directors on AC; **ACMEET =** number of AC committee meetings; **ACEXP** = proportion of AC members with financial expertise; **BOARDDUAL =** 1[IF chairman and chief executive], 0 =otherwise**; BODDIV** = number of women on board; **BODIND =** proportion of non-executive directors on board; **BODSIZE =** number of members on board; **BODMEET =** number of board meetings; **BODDIV =** number of women on board**; SUBOWN =** total percentage of substantial shareholding who own 5% or more; **SIZE =** natural log of total asset; **ROE =** return on equity**; LEV =** debt to asset ratio**; INDUSTRY** = industry dummies.

2.5.4 Correlation Matrix

Table 2.4 presents the Spearman correlation matrix for the dependent and independent variables. Correlation above 0.8 between independent variables indicates that multicollinearity is present and might affect the results (Haniffa and Cooke, 2005; Gujarati, 1995). Correlation coefficients in Table 2.4 show that collinearity is not present. As the table shows, environmental disclosure quality and volume is positively correlated with resource base variables viz. SIZE and ROE, and with key CG variables viz. AC composite measure (ACQUAL), board size (BODSIZE), board meeting (BODMEET) and board diversity (BODDIV). Moreover, disclosure volume and quality is negatively correlated with board independence (BODIND) while substantial ownership (SUBOWN) is positively correlated with the volume of disclosure (VOL) and negatively correlated with disclosure quality (QUAL). As the table illustrates, there is high degree of cross-correlation between key variables, including the governance variables, which means that care is required when constructing models to capture their individual and joint effects. Table 2.5 shows that the variance inflation factors on these variables (VIF) are all within acceptable limits (less than 10) thus confirming that multicollinearity is not an issue (Haniffa and Cooke, 2005).

Table 2.4- Spearman Correlation Matrix for Dependent and Independent Variables

Variables	QUAL	VOL	ACSIZE	ACIND	ACMEET	ACEXP	ACQUAL	BODDUAL	BODSIZE	BODIND	BODMEET	BODDIV	SIZE	ROE	LEV	SUBOWN
QUAL	1															
VOL	0.6836 ***	1														
ACSIZE	-0.0893 ***	-0.0855 ***	1													
ACIND	0.0173	-0.0317	0.0288	1												
ACMEET	0.1798 ***	0.1212 ***	0.161 ***	0.072 **	1											
ACEXP	-0.0516 *	-0.0912 ***	-0.3815 ***	0.0287	-0.0994 **	1										
ACQUAL	0.1342 ***	0.1193 ***	0.0418	0.588 ***	0.2691 ***	0.0563 *	1									
BODDUAL	0.0216	0.0219	-0.0912 ***	-0.0138	-0.001	0.0879 ***	0.0125	1								
BODSIZE	0.1746 ***	0.1686 ***	0.3726 ***	0.0941 ***	0.4023 ***	-0.1857 ***	0.1975 ***	-0.0371	1							
BODIND	-0.2127 ***	-0.2181 ***	0.2232 ***	0.1223 ***	0.0236	0.05	-0.0239	-0.0659 **	-0.1342 ***	1						
BODMEET	0.1647 ***	0.1441 ***	-0.051 *	0.0192	0.2329 ***	-0.0504 *	0.0996 ***	0.022	0.0142	-0.1074 ***	1					
BODDIV	0.0263	-0.0478	0.1467 ***	0.0505 *	0.0555 **	-0.0423	0.0228	-0.0036	0.1431 ***	0.043	0.0247	1				
SIZE	0.1492 ***	0.0857 **	0.2806 ***	0.0982 ***	0.3968 ***	-0.155 ***	0.1731 ***	-0.0593 **	0.5718 ***	0.1005 ***	0.1103 ***	0.1456 ***	1			
ROE	0.0923 ***	0.1315 ***	-0.0113	-0.0284	0.0085	-0.0994 ***	0.0226	0.0694 **	0.0495 *	-0.1507 ***	0.0463	-0.0215	-0.0249	1		
LEV	0.095 ***	0.1091 ***	-0.0192	-0.0581 **	0.0183	-0.0885 ***	-0.0062	0.0077	0.1034 ***	-0.0546 *	0.0805 ***	0.0832 ***	0.2026 ***	0.0287	1	
SUBOWN	-0.0148	0.0556 *	-0.1334 ***	-0.0798 ***	-0.0542 *	0.054 *	-0.0636 **	0.0774 ***	-0.1132 ***	-0.0095	-0.0668 **	-0.186 ***	-0.163 ***	0.0026	-0.0037	1

*** indicates p<.01, ** p<.05, * p<0.1

VOLDISC = total environmental phrases per coded category using CONI method; **QUALDISC** = qualitative measure of disclosure based on 5 types in CONI; **ACQUAL** = 1 [if all AC members are independent non-executive directors and ACMEET=>3, and ACEXP =>1, and ACSIZE =>3], otherwise =0; **ACSIZE** = number of AC members; **ACIND =** proportion of independent non-executive directors on AC; **ACMEET =** number of AC committee meetings; **ACEXP** = proportion of AC members with financial expertise; **BOARDDUAL =** 1[IF chairman and chief executive], 0 =otherwise**; BODDIV** = proportion of women on board; **BODIND =** proportion of non-executive directors on board; **BODSIZE =** number of members on board; **BODMEET =** number of board meetings**; SUBOWN =** total percentage of substantial shareholding who own 5% or more; **SIZE =** natural log of total asset; **PROFIT =** return on equity**; LEV =** debt to asset ratio**; INDUSTRY** = industry dummies.

Table 2.5- VIF Value for Disclosure Model

Variable	VIF
BOARDSIZE	2.01
SIZE	1.84
ACQUAL	1.52
ACMEET	1.5
ACIND	1.45
ACSIZE	1.38
BODIND	1.37
BODMEET	1.13
ACEXP	1.13
LEV	1.05
BODDIV	1.04
ROE	1.04
BODDUAL	1.02
Mean VIF	1.35

ACQUAL = 1 [if all AC members are independent non-executive directors and ACMEET =>3, and ACEXP =>1, and ACSIZE =>3], otherwise =0; **ACSIZE** = number of AC members; **ACIND =** proportion of independent non-executive directors on AC; **ACMEET =** number of AC committee meetings; **ACEXP** = proportion of AC members with financial expertise; **BOARDDUAL =** 1[IF chairman and chief executive], 0 =otherwise**; BODDIV** = proportion of women on board; **BODIND =** proportion of non-executive directors on board; **BODSIZE =** number of members on board; **BODMEET =** number of board meetings**; SUBOWN =** total percentage of substantial shareholding who own 5% or more; **SIZE =** natural log of total asset; **ROE =** return on equity**; LEV =** debt to asset ratio

Table 2.6 reports mean values of key variables by industry. The data show that the basic materials and the oil and gas industry tend to disclose the most by volume and quality of disclosure. These firms also have high resource base in terms of both capital and profitability. It is also interesting to note that companies from the oil and gas sector enjoy large number of members on the board and high mean of audit quality index suggesting that audit committees and governance structure play a mediating role and help firms engaging in sensitive activities towards the environment to disclose and signal to the market about their environmental behaviour where those signals need to be difficult to replicate by competitors. Financial services disclose the least on both measures, and these industries illustrate the contrast in relative sensitivity of activities towards the environment. In general industries disclosing high volume tend to also make high quality disclosures, although not in all cases. Consumer services firms, for example, have high quality disclosure but not a correspondingly high volume.

Table 2.6- Variables by Industry

Variable	QUALDISC	VOLDISC	SIZE	ROE	ACQUAL	BOARDSIZE	BODIND	BODMEET	BODDUAL	BODDIV	SUBOWN	LEV
Oil & Gas	3.57	57.91	14.59	0.207	0.946	11.13	0.617	8.70	0.036	0.081	0.251	0.132
Basic Materials	3.73	71.20	14.26	0.375	0.848	9.35	0.728	7.63	0.038	0.075	0.367	0.204
Industrials	3.73	56.86	14.72	0.261	0.835	8.76	0.601	9.09	0.030	0.064	0.217	0.227
Consumer Goods	3.56	40.36	15	0.562	0.885	9.60	0.651	8.59	0.000	0.136	0.245	0.250
Health Care	3.28	46.28	15.16	0.209	0.960	10.44	0.745	7.96	0.000	0.111	0.161	0.267
Consumer Services	3.63	38.15	14.75	0.789	0.813	9.50	0.628	8.77	0.030	0.117	0.279	0.300
Telecommunications	3.96	42.4	14.61	0.516	0.640	10.88	0.675	8.00	0.040	0.115	0.224	0.256
Utilities	3.52	57.96	14.45	0.241	0.926	10.07	0.603	8.81	0.037	0.114	0.216	0.568
Financials	2.04	16.42	14.76	0.092	0.827	9.23	0.742	7.77	0.024	0.089	0.236	0.187
Technology	3.27	41.02	15.15	0.050	0.836	8.64	0.644	9.24	0.018	0.057	0.329	0.090

VOLDISC = total environmental phrases per coded category using CONI method; **QUALDISC** = qualitative measure of disclosure based on 5 types in CONI; **ACQUAL** = 1 [if all AC members are independent non-executive directors and ACMEET =>3, and ACEXP =>1, and ACSIZE =>3], otherwise =0; **ACSIZE** = number of AC members; **ACIND =** proportion of independent non-executive directors on AC; **ACMEET =** number of AC committee meetings; **ACEXP** = proportion of AC members with financial expertise; **BOARDDUAL =** 1[IF chairman and chief executive], 0 =otherwise**; BODDIV** = proportion of women on board; **BODIND =** proportion of non-executive directors on board; **BODSIZE =** number of members on board; **BODMEET =** number of board meetings**; SUBOWN =** total percentage of substantial shareholding who own 5% or more; **SIZE =** natural log of total asset; **ROE =** return on equity**; LEV =** debt to asset ratio**; INDUSTRTY** = industry dummies.

2.5.5 Results and Discussion

The results for measuring the effects of CG mechanisms on environmental disclosure are presented in Table 2.7. The main regression model is run in parts. Models (2.1), (2.3) and (2.5) use VOLDISC as the dependent variable, which is a count measure and therefore negative binomial specifications are employed[4]. Models (2.2), (2.4) and (2.6) which use QUALDISC (a1-5 ascending scale variable), employ an ordered-Probit specification. All tests use random effects with robust standard errors. Hausman and Breusch-Pagan LM tests confirm this as the correct specification[5]. Models (2.1) and (2.2) show the effects of the resource base variables (SIZE and ROE_{t-1}) plus control variables on the quality and volume of disclosures. Models (2.3), (2.4), (2.5) and (2.6) add board and AC variables.

The study runs panel data regression instead of pooled regression to be able to control for firm's unobserved specific effects and consequently get more valid results (Elsayed and Paton, 2005). The conditional fixed effects negative binomial model for count data due to Hausman et al. (1984) does not control for true individual fixed effects. It does not necessary remove the individual fixed effects in count panel data. It allows, moreover, for individual specific variation in the dispersion parameters rather than in the conditional mean (Allison and Waterman, 2002). Greene (2007) argues that in the fixed effects negative binomial model, the fixed effects enter the model through the dispersion parameter rather than the conditional mean function. This has the inference that time invariant variables can coexist with the effects. Therefore, it is not possible to conclude that fixed effects negative binomial estimator is a consistent factor of a model that contains heterogeneous mean thus it does not control for heterogeneity.

[4] Pearson goodness of fit tests suggested over-dispersion in alternative Poisson models.
[5] Only random effects are feasible in 2.2, 2.4, and 2.6. There is no command for conditional fixed effects model with ordered Probit.

Greene (2007) claims that fixed effects negative binomial estimator does suffer from the incidental parameter problem. Allison (2012) suggests that random effects negative binomial model is the solution as it does not require the estimation of individual specific parameters. Hence, there is no reason to expect that it would suffer from incidental parameter bias.

The advantage of CONI data is that it allows us to test 1-5 type disclosure as thresholds, as a measure of disclosure quality. The traditional Ordered Probit model implies that all variables are constraints and it neglects possible heterogeneous effects of explaining factors. On the other hand, the statistic for computing Ordered Probit model with fixed effects is extremely complex where estimator is not consistent, and the most appealing alternative is random effects Ordered-Probit.

Previous CG literature highlighted the endogeneity issue (Roberts and Whited, 2011; Armstrong et al., 2010; Brown et al., 2011; Lim et al., 2007) arguing that using cross-sectional analysis will cause researchers to treat CG variables as exogenous in the model where they might have endogenous effects (Brown et al., 2011). Endogeneity exists due of simultaneity or omitted variables where explanatory variables will be endogenous and correlated with the error term which will lead to biased results. The study reports Durbin-Wu test (Hausman, 1978) to investigate the presence of endogeneity (Gujarati, 2003). Accepting the null hypothesis that variables are exogenous confirms the absence of endogeneity effects. Durbin-Wu-Hausman results confirm that the hypothesis could not be rejected as the F-test is not significant for each measure of environmental disclosure viz. quality and quantity.

Results of Model 2.1 and 2.2 that show the effects of resource base variables on the quality and volume of disclosure indicate that size but not profit determines disclosure

quality and volume. This supports the view of legitimacy theory that states large companies are highly visible and most likely engaged in activities with substantial influence on society so they tend to increase the volume of information disclosed about these activities including environmental activities (Cormier and Gordon, 2001; Cormier et al., 2004; Deegan, 2002). In the RBV approach, the scale and scope of the firm operation is also likely to increase the quality of disclosure, as such firms engage in activities that are difficult to replicate from the point of view of competitors. Table 2.4 shows that ROE_{t-1} is negatively correlated with SIZE and SUBOWN. However in the absence of these variables, ROE_{t-1} remained insignificant as a determinant of QUALDISC and VOLDISC.

Of the control variables, substantial ownership (SUBOWN) is significant in models where VOLDISC is the dependent variable. It is shown to be positively associated with the volume of disclosure but not quality at $p<0.05$, suggesting that ownership blocks promote the volume but not the quality of disclosure. Table 2.4 shows that size is negatively correlated with SUBOWN, suggesting that firms with influential block holders are typically smaller. In models where SUBOWN is insignificant (i.e. where QUALDISC is the dependent variable), the results stand when the SIZE variable is dropped from the model. Previous studies (e.g. Halme and Huse, 1997; Eng and Mak, 2003; Barako et al., 2006) argue that substantial shareholders tend to disclose more information voluntarily in order to compensate for any conflict of interest between shareholders and management due to the separation between ownership and control; such a fact incurs monitoring costs that can be reduced by additional disclosure. Most of these studies measured disclosure based on a mere volume, or developed a disclosure index based on ratings of the most used disclosure items. Such techniques do not help in VRIN asset creation. Results indicate that substantial shareholding tends to increase the

volume of disclosure but not the quality that fulfils the difficulty of replication conditions. Disclosure volume could be a mere narrative, and thus classified as false claims "greenwash" that is unlikely to result in added value.

Tests featuring the governance variables in Model (2.3) and Model (2.4) show that ACQUAL significantly increases the volume of disclosure at $p<0.01$ level. In Model (2.4), ACQUAL has a similar effect on quality at the same level of significance. Of the BODVAR set, board size (BODSIZE) is significant and positively related to VOLDISC and QUALDISC at $p<0.01$. Table 2.4 reveals that BODSIZE is negatively correlated with BODIND, BODDUAL, and SUBOWN. In the absence of these variables, BODSIZE is not significant. Board independence (BODIND) is significant at $p<0.01$ but inversely related to QUALDISC and VOLDISC. This indicates that independent directors might reduce attention to CSR, focusing instead on financial matters, or conversely firms appoint non-executives to specifically cover CSR briefs (Arora and Dharwadkar, 2011). De Villiers et al. (2011) argues that firms with a high level of independent directors may lack the firm specific knowledge and awareness required for ensuring strong environmental performance. Board meeting (BODMEET) shows positive significant association at $p<0.01$ with VOLDISC and marginally significant with QUALDISC. This is in line with previous studies (e.g. Carcello et al., 2002; Laksmana, 2008), and supports the argument that more meetings enhance vigilance of financial reporting and board decision making.

Other CG variables are not shown to be significant. The components of the ACQUAL variable were also tested separately in Model (2.5) and (2.6) but were not individually significant except for ACMEET, suggesting that the Smith recommendations are only effective in combination. An interaction variable combining ACQUAL and BODSIZE was insignificant in all models suggesting the absence of

complementary effects. These results are consistent with the study hypothesis suggesting that Smith compliant audit committees increase the quality of disclosures but not necessary volume. They prove the RBV argument that AC is a competitive advantage assets because it promotes quality disclosures that are difficult for competitors to replicate, thereby signalling the firm specific competitive advantage to the market. Industry grouping variables in all models were significant for both quality and volume of disclosure indicating that industries disclosing high volume tend to also make high quality disclosure although not in all industries as shown in Table 2.6.

Table 2.7- Determinants of Environmental Disclosure

Variable Dependent variable	2.1 VOLDISC	2.2 QUALDISC	2.3 VOLDISC	2.4 QUALDISC	2.5 VOLDISC	2.6 QUALDISC
	Negative Binomial	Ordered Probit	Negative Binomial	Ordered Probit	Negative Binomial	Ordered Probit
SIZE	0.074***	0.148***	0.051***	0.121***	0.105***	0.004
	(4.41)	(4.79)	(2.67)	(3.49)	(2.92)	(0.18)
ROE_{t-1}	0.011	0.037	0.007	0.046	0.034	0.020
	(0.35)	(0.58)	(0.14)	(0.73)	(0.55)	(0.64)
ACQUAL			0.214***	0.402***		
			(3.92)	(3.88)		
ACSIZE					-0.074	-0.033
					(1.54)	(1.17)
ACIND					0.294	0.030
					(1.49)	(0.29)
ACMEET					0.088***	0.041**
					(2.93)	(2.56)
ACEXP					0.046	0.033
					(1.00)	(1.33)
BOARDSIZE			0.065***	0.089***	0.091***	0.093***
			(4.71)	(3.21)	(3.27)	(6.19)
BODIND			-0.078***	-0.122***	-0.119***	-0.109***
			(4.28)	(3.36)	(3.12)	(5.11)
BODMEET			0.017***	0.023*	0.015	0.019***
			(2.73)	(1.75)	(1.15)	(2.80)
BODDUAL			-0.134	-0.069	-0.074	-0.142
			(1.10)	(0.30)	(0.32)	(1.08)
BODDIV			-0.099	0.198	0.214	-0.048
			(0.41)	(0.45)	(0.49)	(0.19)
SUBOWN	0.224**	-0.008	0.237**	0.046	0.014	0.165
	(1.97)	(0.04)	(2.05)	(0.21)	(0.06)	(1.32)
LEV	0.073	-0.171	0.023	-0.195	-0.163	0.089
	(0.48)	(0.62)	(0.16)	(0.74)	(0.62)	(0.55)
INDUSTRY DUMMIES	Included	Included	Included	Included	Included	Included
_cons	-0.955***	0.320	-0.944***	0.523	0.338	0.781**
	(3.55)	(5.10)	(3.46)	(1.11)	(0.63)	(2.39)
Log likelihood	-5074.82	-1492.69	-5048.96	-1475.15	-1477.7488	-5132
N	1120	1120	1120	1120	1120	1120
Hausman	21.77		40.13		40.10	
Durbin-Wu	1.113	1.527	0.316	1.274	1.112	1.133

Notes: Heteroscadasticity robust t-statistics reported in parentheses. *** indicates p<.01, ** p< 0.05, * p< 0.1 **VOLDISC =** total environmental phrases per coded category using CONI method; **QUALDISC** = qualitative measure of disclosure based on 5 types in CONI; **ACQUAL** = 1 [if all AC members are independent non-executive directors and ACMEET =>3, and ACEXP =>1, and ACSIZE =>3], otherwise =0; **ACSIZE** = number of AC members; **ACIND =** proportion of independent non-executive directors on AC; **ACMEET =** number of AC committee meetings; **ACEXP** = proportion of AC members with financial expertise; **BODSIZE =** number of members on board; **BODIND =** proportion of non-executive directors on board; **BODMEET =** number of board meetings; **BOARDDUAL =** 1[IF chairman and chief executive], 0 =otherwise **BODDIV =** proportion of women on board**; SUBOWN =** total percentage of substantial shareholding who own 5% or more; **SIZE =** natural log of market capitalization; **ROE =** return on equity**; LEV =** debt to asset ratio; **INDUSTRY** = industry dummies.

2.5.6 Sensitivity Test

As an additional test, the study applies panel data random effects with robust standard errors. Hausman and Breusch-Pagan LM tests confirm this as the correct specification and Durbin Wu tests confirm the absence of residual endogeneity. Results of tests of the four models are presented in Table 2.8. Model (2.1) and (2.2) indicate that size but not profit determines the quality and volume of disclosure consistent with the main test. Of the BODVAR variable set, BODIND is significant and negatively related to QUALDISC but not VOLDISC. Moreover, BODMEET is also shown to be significant and positively related to disclosure quality but not volume.

ACQUAL significantly increases the volume and the quality of disclosure. Control variables viz. leverage and substantial ownership are insignificant except the industry grouping variables that are shown to be positive and significantly related to disclosure volume and quality. These findings support the hypothesis that the quality of environmental disclosure is positively related to the resource base of the firm and the quality of AC. These relationships are driven by competitive advantage strategies leading to VRIN assets, or in other words determined by an RBV and quality signalling framework.

Table 2.8- Disclosure Determinants with Random/Fixed Effects Panel Data

Dependent variable	VOLDISC (2.1)		QUALDISC (2.2)		VOLDISC (2.3)		QUALDISC (2.4)		VOLDISC (2.5)		QUAL (2.6)	
	Panel Data Analysis											
	RE	FE	RE	FE	RE	FE	RE	FE	RE	FE	RE	FE
SIZE	3.45***	7.70	0.157***	0.338*	2.45**	7.60*	0.136***	0.331*	2.19**	7.65***	0.126***	0.328***
	(3.50)	(1.58)	(4.11)	(1.67)	(2.34)	(1.68)	(3.26)	(1.72)	(2.26)	(3.24)	(3.17)	(2.82)
ROE_{t-1}	0.091	0.083	0.006	0.006	0.092	0.029	0.009	0.004	0.055	0.026	0.004	0.009
	(0.06)	(0.06)	(0.09)	(0.09)	(0.06)	(0.02)	(0.13)	(0.06)	(0.04)	(0.002)	(0.06)	(0.12)
ACQUAL					8.71***	9.37***	0.424***	0.389***				
					(3.60)	(3.21)	(4.22)	(3.43)				
ACSIZE									-1.088	-0.477	-0.075	-0.05
									(0.94)	(0.35)	(1.42)	(0.74)
ACIND									-0.447	-0.364	0.302	0.219
									(0.10)	(0.08)	(1.41)	(0.93)
ACMEET									1.459**	1.205	0.075**	0.049
									(2.0)	(1.34)	(2.29)	(1.12)
ACEXP									1.319	1.68	0.031	0.086
									(1.23)	(1.40)	(0.62)	(1.44)
BOARDSIZE					1.32*	2.05*	0.088**	0.033	1.338*	1.97*	0.091***	0.033
					(1.93)	(2.23)	(2.49)	(0.66)	(1.93)	(2.12)	(3.03)	(0.73)
BODIND					-8.79	-13.20	-1.437***	-0.151	-0.87	-1.703	-0.134***	-0.007
					(1.07)	(1.18)	(3.74)	(0.29)	(0.93)	(1.44)	(3.21)	(0.13)
BODMEET					0.547	0.684*	0.029**	0.030*	0.468	0.654*	0.025*	0.027
					(1.54)	(1.67)	(2.15)	(1.88)	(1.45)	(1.77)	(1.70)	(1.53)
BODDUAL					-0.028	-6.39	-0.028	-0.311	-4.361	-6.19	0.001	0.313
					(0.09)	(0.97)	(0.09)	(0.85)	(0.80)	(1.02)	(0.01)	(1.05)
BODDIV					0.22	-1.77	0.22	0.126	-1.72	-1.11	0.257	0.139
					(0.46)	(0.15)	(0.46)	(0.20)	(0.16)	(0.09)	(0.54)	(0.23)
SUBOWN	8.863	2.73	-0.116	-0.297	9.58	3.45	-0.052	-0.286	8.708	3.57	-0.084	-0.272
	(1.30)	(0.35)	(0.42)	(0.85)	(1.44)	(0.45)	(0.19)	(0.83)	(1.60)	(0.54)	(0.34)	(0.84)
LEV	-5.897	-16.44	-0.234	-1.28**	-7.46	-19.01	-0.287	-1.31**	7.06	20.59*	-0.241	1.34**
	(0.93)	(1.34)	(0.76)	(2.07)	(1.18)	(1.56)	(0.99)	(2.16)	(1.01)	(1.78)	(0.83)	(2.35)
INDUSTRY DUMMIES	Included		Included		Included		Included		Included		Included	
_cons	36.71**	-70.74	-0.255	-1.437	32.24*	-81.14	0.600	-1.381	-31.44**	-88.04**	-0.362	-1.53
	(2.42)	(0.99)	(0.43)	(0.49)	(1.86)	(1.23)	(0.92)	(0.50)	(2.17)	(2.42)	(0.61)	(0.86)
R-sq	0.265	0.006	0.242	0.003	0.278	0.022	0.285	0.008	0.27	0.014	0.27	0.003
N	1120	1120	1120	1120	1120	1120	1120	1120	1120	1120	1120	1120
Hausman Test	9.20		9.98		12.99		9.65		11.99		9.66	
BP-LM	266.58***		100.50***		297.13***		144.90***		299.1***		145.23	
Durbin-Wu	1.113		1.527		0.316		1.274		1.222		1.113	

Notes: Heteroscadasticity robust t-statistics reported in parentheses. *** indicates p<.01, ** p< 0.05, * p< 0.1

VOLDISC = total environmental phrases per coded category using CONI method; **QUALDISC** = qualitative measure of disclosure based on 5 types in CONI; **ACQUAL** = 1 [if all AC members are independent non-executive directors and ACMEET =>3, and ACEXP =>1, and ACSIZE =>3], otherwise =0; **ACSIZE** = number of AC members; **ACIND =** proportion of independent non-executive directors on AC; **ACMEET =** number of AC committee meetings; **ACEXP** = proportion of AC members with financial expertise; **BODSIZE =** number of members on board; **BODIND =** proportion of non-executive directors on board; **BODMEET =** number of board meetings; **BOARDDUAL =** 1[IF chairman and chief executive], 0 =otherwise **BODDIV =** proportion of women on board**; SUBOWN =** total percentage of substantial shareholding who own 5% or more; **SIZE =** natural log of market capitalization; **ROE =** return on equity**; LEV =** debt to asset ratio; **INDUSTRY** = industry dummies.

2.6 Conclusion

The study focuses on the contribution that audit committees plays above that provided by the board of directors to CERD. It contributes to the global debate about the overall CG strength and addresses the role of effective ACs towards CERD. Environmental disclosure practice within annual reports is measured using CONI method that was introduced to the academic research by Beck et al. (2010), but to the best of my knowledge, it has not been used yet to measure CG effects on corporate environmental disclosure. Beck et al. (2010) define CONI as a quantitative measurement on a qualitative interrogation sufficient to measure the quality and the quantity of information disclosed. A quantitative measurement is employed based on the number of disclosure items per category using phrases count, and qualitative measure is based on testing type (1-5) disclosures referred to in CONI as thresholds as a measure of disclosure quality where the highest score is given to the highest ranking phrase.

The study uses a resource-based view (RBV) and quality signalling approach to examine the extent that disclosures are determined by the presence of robust governance procedures, including the use of ACs subsequent to the Smith Report and combined code. According to this approach where ethical actions are designed to create VRIN assets, managers have a strong incentive to signal the value of their investment using annual reports disclosure. The study proposes that where firms create high quality AC, the apparent relationships and specifically how AC quality impacts on disclosure practice will be reinforced.

A notable feature of the results was the lack of significance of individual governance variables either as features of the AC or the board. It could be concluded for example that because accounting expertise does not individually enhance CER, then

accounting skills and training are not useful for promoting this kind of practice, or that board diversity has no effect. However, caution is needed when interpreting this apparent lack of significance. Many of these features are time invariant, which can be a cause of apparent insignificance and model specification issues, a point widely recognised in CG research (Roberts and Whited, 2011; Armstrong et al., 2010; Brown et al., 2011; Lim et al., 2007). In view of these data limitations, it is appropriate to conclude only on the variables where significance can be demonstrated.

The empirical results show some support for the RBV quality signalling approach. Larger firms possess greater resource bases and have the ability therefore to invest in non-replicable CSR strategies. These firms do not merely increase the volume of disclosure, as might be predicted by the political costs and legitimacy approaches, but also the quality of disclosure. ACs which possess Smith Report compliant features also promote quality disclosures, which is not achieved by other governance features, including board size and structure.

This study contributes to the debate on the effectiveness of CG mechanisms by providing evidence on the positive impact of effective ACs in improving environmental practices. Although social and environmental reporting is not mandatory, it eventually could become a standard aspect of the company's annual report. ACs need to address social and environmental responsibility issues as vital elements of firms' business strategies, and they need to highlight the risk associated with these issues and its potential impact on the business environment. Companies are encouraged to integrate social and environmental responsibility issues in core decision making processes based on the long term value they add (Mallin et al., 2012). Thus, this will demand a new role for boards, and AC in particular, in terms of corporate activities and accountability. This chapter examined the role of effective ACs on better quality disclosures. Perhaps audit

committees also have a direct impact on promoting environmental reputation along with the role of environmental disclosure in the creation and sustenance of such reputation. Detailed theoretical and methodological concerns are tackled in the following chapter in an attempt to answer the specific research questions addressed, as illustrated in the introductory chapter at the beginning of the thesis.

CHAPTER THREE

THE IMPACT OF CORPORATE ENVIRONMENTAL DISCLOSURES AND AUDIT COMMITTEES ON ENVIRONMENTAL REPUTATION

CHAPTER THREE

THE IMPACT OF CORPORATE ENVIRONMENTAL DISCLOSURES AND AUDIT COMMITTEES ON ENVIRONMENTAL REPUTATION*

3.1 INTRODUCTION

This chapter uses an RBV and quality signalling approach to examine the determinants of firms' reputation for CSR, or specifically their environmental reputation. According to this approach, where ethical actions are designed to create reputational assets that are valuable, rare, inimitable and non-replicable (VRIN) (Barney et al., 2011), managers have a strong incentive to signal the value of their investment using annual report disclosures, and will indeed enhance the reputation of the firm by making them (Toms, 2002; Hasseldine et al., 2005). To add to the knowledge of these relationships, the study proposes that where firms also create high quality ACs, the positive relationship between disclosure quality and reputation will be reinforced.

Increased international attention has been given to the potentially beneficial role of audit, and audit committees, in the wake of the Enron and other scandals. In the UK, the Smith Report (2003) specified the role of the audit committee and its main responsibilities.[6] It has been argued that an effective AC is essential for effective governance (Zaman et al., 2011), and it follows, insofar as governance mechanisms promote the quantity and quality of accounting disclosure, that audit committees, bringing accounting skills and experience to bear, will have a positive and important

* This chapter has been reviewed by the *British Accounting Review (BAR)* in a paper with co-authors: Professor Steven Toms & Dr Aly Salama

[6] Main role and responsibilities, section 2.1, membership and opportunities 3.1-3.4, meetings 3.5-3.10, resources 3.11-3.14, remuneration 3.15, skills, experiences and training 3.16-3.19, relationship with the board 4.1- 4.4.

influence on disclosure, including CSR disclosure. It is also possible that AC could help in assessing CER issues when auditing financial reports and risks associated with these issues which should help in enhancing reputation and generating competitive advantage.

Managers have potentially strong incentives to utilise governance mechanisms in this fashion. First, effective governance can itself be a source of competitive advantage, thereby forming a natural extension of the RBV framework (Madhok, 2000; Barney et al., 2011). The consequence may be, therefore, that managers receive guidance on developing and disclosing best practice. Second, because investors have difficulty evaluating the effect of voluntary un-audited disclosures in terms of future earnings (Rajgopal et al., 2003), audit reduces information asymmetry (Healy and Palepu, 2001) and uncertainty, and provides increased assurance (Chow, 1982; Watts and Zimmerman, 1983) that with respect to CER, disclosure genuinely reflects the company's achievements (KPMG, 2002).

Audit committees in particular can reduce agency costs by providing substantive oversight of financial reporting (Collier and Gregory, 1999). Independent external assurance creates credibility and trust (Turley and Zaman, 2003), which in turn develop and maintain the intangible asset that comprises the firm's CER and valorises competitive advantage. Most importantly, where CSR investments are intended to create VRIN assets, audit assurance will help further discriminate between genuine investments and false claims ('greenwash') (Lyon and Maxwell, 2011) from competitors about commitment to sustainability. With audit assurance, true claims are more likely to be correctly classified and false claims as 'greenwash', so that mere volume of disclosure is unlikely to result in added value.

The study presents evidence to test these apparent relationships and specifically how disclosure quality and possibly volume impacts on environmental reputation of the firm with AC quality moderating effects. It thereby builds on prior studies that examined the impact of disclosure on firms' environmental reputation (Toms, 2002; Hasseldine et al., 2005) by considering the specific impact of effective AC on environmental reputation. The study also examines the role of other governance mechanisms in conjunction with audit committees. It uses a sample of UK FTSE 350 companies during the period 2007-2011 and, thereby, updates the evidence from earlier empirical studies that have shown a stronger impact for higher quality, difficult to replicate, disclosures (Toms, 2002; Hasseldine et al., 2005). The study purpose is to answer the question, does the combination of quality disclosures and audit committee add to the reputation of the firm? To examine this relationship, the remainder of the chapter is in four sections. The next section develops literature review and the theoretical framework leading to hypothesis suitable for answering the research questions. The third section sets out the research study in terms of sample data, and models. A fourth section reviews the empirical results. The final section deals with limitations of the study and draws conclusions.

3.2 LITERATURE REVIEW

Reviewing research into the relationship between corporate social and environmental disclosure and social and environmental performance, Toms (2002) links corporate strategy with disclosure strategy based on quality signalling. The author concentrates on what managers are actually doing to maintain competitive advantage rather on what they are trying to avoid based on a narrow range of economic theory, particularly the impact of size and public image. Toms (2002) offers a theoretical extension of the RBV of the firm to include quality signalling. The author provides a connection between RBV theory which is attributed to the firm's ability to create inimitable assets, CG practices, particularly shareholders' ownership, and signalling hypothesis theory. The study argues that investing in environmental initiatives is likely to create environmental reputation that will not be realized without making associated disclosures. Following the quality signalling hypothesis, those signals must be difficult to replicate by competitors in order to create competitive advantage.

Toms (2002) examines the relationship between environmental disclosure and environmental reputation. Environmental reputation is measured using corporate rating for community and environmental responsibility as published in *The Management Today* survey of Britain's Most Admired Companies (MAC). Environmental disclosure was measured using a disclosure level scoring system based on a qualitative hierarchy of disclosure adopted from Robertson and Nicholson (1996). The hierarchy of importance gives low rate to non-quantifiable information and high rate to extremely highly monitored social information. The study argues that disclosure practices play a role in creating environmental reputation where shareholders are active in monitoring disclosures. Therefore it includes some governance variables, particularly shareholders' ownership as a mediating factor helping in the creation of corporate reputation. Other

mediating variables included in this study are firm size, industry grouping and systematic risk. Results support the hypothesis of a positive relationship between environmental disclosure and environmental reputation. Moreover, diverse institutional share ownership and low systematic risk are also correlated with positive environmental reputation. However, the study ignored the possibility of a similar relationship between quantitative disclosure measures and reputation. Moreover, other variables are omitted from the study and may affect the empirical model such as ACs and board of directors' characteristics as mediating variables.

Hasseldine et al. (2005) complement and extend the work of Toms (2002) and present a comparison between qualitative and quantitative measures of environmental activities disclosed in annual reports and compare their relative influence on corporate environmental reputation. Corporate environmental disclosure is computed using quantitative, qualitative and hybrid measure. Quantitative measure is based on content analysis where the total number of sentences is used to capture the total amount of environmental information within corporate annual reports. Qualitative disclosure score as defined by Toms (2002) ranges from (0) score for non-disclosure to (5) score for high quality disclosure. Finally, a quality-adjusted measure of disclosure is used by adding a rating or quality score for every sentence in the annual report to create an aggregate variable. Corporate environmental reputation is taken from the *Management Today* Britain's Most Admired Companies (MAC) survey. The study argues that environmental disclosure may be complemented by investment in R&D which provides a prospect to invest in innovative and more environmentally friendly technology. Other control variables incorporated in this study are shareholders' power, return on equity, firm size, systematic risk, corporate diversification and industry grouping.

Using a sample of 139 UK companies taken from the MAC survey, results suggests that the quality of environmental information disclosed within corporate annual reports has a stronger impact on the creation of environmental reputation rather than mere volume of disclosures. The study shows that RBV of the firm can only be meaningful where incorporated with quality signalling theory. Moreover, it advises managers to pay careful attention to the quality of information disclosed rather than mere quantity in order to create an environmental reputation and achieve competitive advantage. The study incorporates a proxy variable for institutional shareholders' power arguing that governance structure would play a mediating factor in corporate reputation enhancement based on the monitoring role they provide. However, other CG variables are likely to be added and may affect the empirical results such as board of directors and audit committee effects.

Brammer and Pavelin (2006) analyse the relationship between corporate reputation and social performance for a sample of UK companies based on different elements of corporate social performance. It also examines how reputation effects vary across industries. The study argues that corporate reputation is created through signals related to firms' behaviour. Those signals are received either directly from the firm or through other information channels such as the media or the stock market. Reputation is determined by the firm's social performance, financial performance, ownership composition, media visibility, size and industry. The study employs a sample of 210 UK firms that represent almost 90 per cent of FTSE 100 companies. Reputational data are taken from the Fortune Index, and social performance data are obtained from Ethical Investment Research Services (EIRIS) that provide social performance scores to UK firms covering three social performance issues viz. employment, environment, and community issues. Control variables used in this study are: financial performance,

leverage, systematic risk, size, media exposure, R&D and industry. Results show that social performance enhances corporate reputation. However, it varies across sectors and depends on social performance categories. Firms highly engaged in environmental activities may improve or damage their reputation depending on whether their activities reduce stakeholders' environmental concerns; whereas community involvement has an overall positive impact on reputation as it is expected by stakeholders in all industrial contexts.

Literature has also paid particular attention to the relationship between both CSR and reputation, and corporate financial performance (Ullmann, 1985; Al-Tuwaijri et al., 2004). They argue that good corporate reputations have a strategic value for the firm that obtains them. Ullmann (1985) suggests ways to improve the relationship between social disclosure, social performance and economic performance. He claims that the lack of theories, incomplete specification of empirical models applied, measurement of variables included, and time period are behind the inconsistency in results. The correlation between social performance, social disclosure and economic performance is determined by overall management strategy. A three-dimensional model is offered to explain the conflicting results regarding the correlation between social disclosure, social and economic performance: (i) stakeholder power where it is positively associated with social performance; (ii) strategic posture where active managers seek to influence stakeholders through engaging in social and environmental activities; (iii) past and current economic performance that determine the level of social demands. Ullmann (1985) gives some suggestions and a future outlook by adopting a strategic framework and model enhancement that may affect the correlation of social disclosure, social performance and economic performance.

Based on Ullmann's (1985) argument, Al-Tuwaijri et al. (2004) argue that the mixed results of previous literature regarding the interrelations among environmental disclosure, environmental performance and economic performance might be due to the fact that researchers have not considered that these constructs could be endogenous. Economic performance was measured using a market-based measure, namely annual stock return. Environmental performance was measured using a non-financial ratio based on the relative quantity of hazardous waste. Finally, environmental disclosure was identified using quantitative disclosure of pollution information. Applying a sample of 198 firms, OLS regression shows that economic performance is positive and significantly associated with environmental performance. Moreover, a positive significant relationship was also conducted between environmental performance and environmental disclosure using three-dimensional research designs. The study shows that good environmental performance is significantly associated with good economic performance and also with environmental disclosure using quantitative pollution-related disclosure. Disclosure, if measured in an RBV framework based on difficulty of replication, will be an accurate proxy of managerial strategy. Thus CER is more likely determined by independent and separable aspects of managerial strategy that should provide a potential theoretical solution to the modelling problems.

Roberts and Dowling (2002) examine whether firm reputation can be predicted by previous financial performance. Based on the RBV of the firm, the study argues that corporate reputation is intangible in a way that competitors find difficult to replicate. Therefore, this will help in sustaining competitive advantage and value creation. Reputational data are obtained from Fortune's *American Most Admired Corporations* and firm financial performance is measured using return on assets. Using a sample of

3,141 firms over 15 years (1984-1998), results show that firms with relatively good reputations are better able to sustain superior performance outcomes over time.

As suggested in Toms' (2002) study, governance structure would play a mediating role in the creation of corporate reputation and enhancing social responsibility. Many empirical studies have incorporated CG variables as determinants of social and environmental responsibility issues and suggest an association between CG and CSR. Arora and Dharwadkar (2011) argue that the substitution effect within internal CG mechanisms is behind the uncertainty surrounding the relationship between CG and CSR. The study examines the substitution possibilities within internal governance tools such as institutional ownership, managerial ownership and board independence. Such effects are potentially important considerations when considering the quality of audit committee as a variable that might exhibit complementary or substitution effects in relation to other governance variables. In addition, the study examines whether the relationship between CG and CSR is determined by the level of organisational slack and performance attainment discrepancy thus considering positive and negative aspects of CSR.

Using a sample from S&P500 and KLD Domini 400 for the period 2001-2005, the study applies social performance ratings as a measure of social responsibility obtained from KLD Inc. Findings prove that organisational slack measured using cash and account receivables, and debt to equity ratio and attainment discrepancy in financial performance measured by return on asset (ROA) and market to book ratio (MBR) jointly determine CG hence affecting managerial decision making regarding CSR. However, KLD rating has been criticized by not using publicly available data; it could be beneficial to apply another measure of CSR.

De Villiers et al. (2011) examine the relationship between firm environmental performance and board characteristics. The study addresses board attributes that will lead to strong environmental performance and discovers two roles played by the board, i.e. monitoring and resource provision. Agency theory supports the monitoring function of independent directors and those who own shares in the company indicating that they are more likely to provide substantive oversight and monitoring over the firm's activities. On the other hand, the resource dependence theory indicates that larger boards are composed of resource-rich directors with different skills and expertise and knowledge to assist firms to acquire critical resources and initiate new environmental projects.

De Villiers et al. (2011) use a sample of 2,151 firm observations of US publicly traded firms for social and environmental performance. Environmental performance was measured using the KLD database for the period 2003-2004 which is based on five environmental strengths, namely beneficial products, pollution prevention, recycling, clear energy, and other environmental-related issues. Environmental performance measure is equal to the number of environmental strengths attained. Board monitoring is represented by board independence, board duality, concentration of directors appointed after the CEO, and director's shareholding, while the board resource provision role is represented by board size, legal experts on the board, director tenure, and representation of active CEO on the board. The study also controls for the list of variables related to firm characteristics and industry sensitivity. Results were consistent with agency theory and resource independence theory where environmental performance is shown to be positively associated with directorial monitoring variables such as board independence, and also variables that capture resource provision such as board size. Results indicate moreover that firms with a high level of board independence may lack the firm-specific

knowledge required for enhancing the environmental behaviour. It would also be of importance to examine the role of ACs in enhancing monitoring and assurance and thus assessing CER issues that will lead to strong corporate environmental performance.

Brennan and Solomon (2008) suggest widening the coverage range of CG from that traditional goal of maximizing shareholders' wealth to include stakeholders' accountability and social responsibility as essential factors for sustainable growth and social welfare. The study develops an analytical framework with six dimensions that considers broadening the theoretical lens, adding more accountability mechanisms, applying different methodologies and techniques, expanding the time horizon, and finally diversifying sectors. The study calls for a move away from the supremacy of agency theory to consider a stakeholder-oriented focus. The study recommends having revised codes in CG and embracing a stakeholder-oriented approach and social responsibility issues. This new tactic should help researchers to build new ideas and develop new techniques from a different perspective of CG.

Aguilera et al. (2006) investigate the difference in the importance of CSR practices between the US and the UK. They argue that CSR is more integrated into CG practices in the UK than in the US due to pressure from market participants. The study argues that institutional investors in the UK are becoming more aware of the importance of social and environmental issues so that they incorporate them in their investment decisions. The UK market is dominated by pension funds and insurance companies which are more likely to be focused on long-term returns while the US market is dominated by mutual funds motivated by short-term return. For that reason, social and environmental responsibility activities get greater attention in the UK than in the US. The study analyses the motives behind institutional investors' behaviour in encouraging social and environmental disclosure practices viz. instrumental, relational and moral

motives. It concludes by giving a recommendation to US institutional investors to adopt UK disclosure practices. However this study needs to empirically test the impact of institutional investors on CSR by collecting data related to institutional investors in the US and the UK.

Spitzeck (2009) examines the patterns of incorporating corporate responsibility into companies' decision making structures and its impact on the development of governance structure. The study uses the Business in the Community Corporate Responsibility Index (CRI) as a data source. It is a questionnaire-based index filled out by contributing organisations and evaluated by independent experts for accuracy and reliability. Results support directors' role, specifically CEO leadership in corporate responsibility matters. They show that having multiple board members accountable for corporate responsibility is an effective governance mechanism. Also, the study concludes that the corporate responsibility committee measured by the corporate responsibility index (CRI) is beneficial to corporate responsibility performance. The study applies a stakeholders' perspective to CG. The research could be led using other perspectives such as the strategic aspect of CSR. Moreover, the CRI index is based on 51 organisations that are continuously participating so they might become better in filling out the questionnaire.

Jamali et al. (2008) explore the interrelationships between corporate governance and CSR theoretically by reviewing the literature and empirically by collecting managers' perception of a sample of firms operating in Lebanon. The study introduces three relational models examining the association between CG and CSR: (i) CG as foundational requirement or pillar for sustainable CSR where CG mechanisms act as a basis for CSR activities. Other CSR pillars include human capital, stakeholder capital, and environment. Investors and senior management's attention should be focused on

those pillars in order to enhance firm value-creating. (ii) CSR as an attribute of CG where companies need to comply with the social and ethical dimensions of society. Hence, being socially responsible should be implanted in CG structure. (iii) CG and CSR as complementary components of the same scale where weak governance and social responsibility policies are two sides of the same coin.

Jamali et al. (2008) employ a qualitative approach by interviewing managers of different companies in Lebanon and questioning them about issues focusing on compliance, transparency, and disclosure. Managers stress the role of the board and ACs in supervising the company disclosure practices and compliance with laws and regulations. Findings show that CG and CSR should not be considered separately regardless of the type of the relationship between CG and CSR.

Harjoto and Jo (2011) suggest that if managers use effective governance mechanisms and CSR engagement to resolve conflicts among stakeholders, CSR engagement should be positively associated with those governance mechanisms. The study empirically tests four competing hypotheses to explore the relation between CG and CSR engagements. The over investment hypothesis is where a negative association between CG and CSR is expected since more active governance is related to the lower agency problem and therefore less over investment. The strategic choice hypothesis is where managers engage in CSR activities for the purpose of securing their jobs, thus a positive relation is expected. The product-signalling approach states firms operating in a competitive environment provide unique and competing products through managers' efforts, thus no impact of CG on CSR engagement is expected. Finally, the conflict resolution hypothesis is where firms use governance effects and CSR engagement to reduce conflict of interest between managers and stakeholders. Findings came in favour of the conflict resolution hypothesis. US evidence based on Kinder, Lydenberg and

Domini's (KLD) measures suggests that CSR engagements are associated with governance characteristics, including board leadership, board independence, institutional ownership and analysts following.

3.2.1 Theory Development

Prior literature has aimed to explain accounting disclosure in terms of legitimacy theory (Wilmshurst and Frost, 2000; Cormier and Gordon, 2001), and accounting disclosure and management strategy using a variety of stakeholder-based approaches (Mcguire et al., 1988, Roberts, 1992; Orlitzky and Benjamin, 2001; Gyongyi, 2008; Van Der Laan et al., 2008), and agency theory (Arora and Dharwadkar, 2011). To some extent these are mutually exclusive (Gray et al., 1995; Adams 2002) . The RBV quality signalling approach builds on the agency approach and the link between competitive advantage and CSR (Porter and Kramer, 2006; Mallin et al., 2012) suggesting the following sequence of relationships. Firms with greater resource endowments have greater incentive and opportunity to integrate CSR into their strategic behaviour. Firms with such resource endowments can make strategic investments, for example in pollution abatement technology, which competitors will find costly and difficult to replicate (Russo and Fouts, 1997). For such investments to be valorised by firms with higher capability, it is necessary that they are transmitted positively into the firm's reputational capital, since CSR investments give rise at least in part, if not substantially, to intangible asset creation.

For positive transmission to occur, signals that are difficult to replicate, in other words quality signals (Akerlof, 1970; Spence, 1973), are necessary through accounting disclosure, which are moderated and reinforced by governance and audit assurance mechanisms. Corporate governance arises from the agency problem associated with the

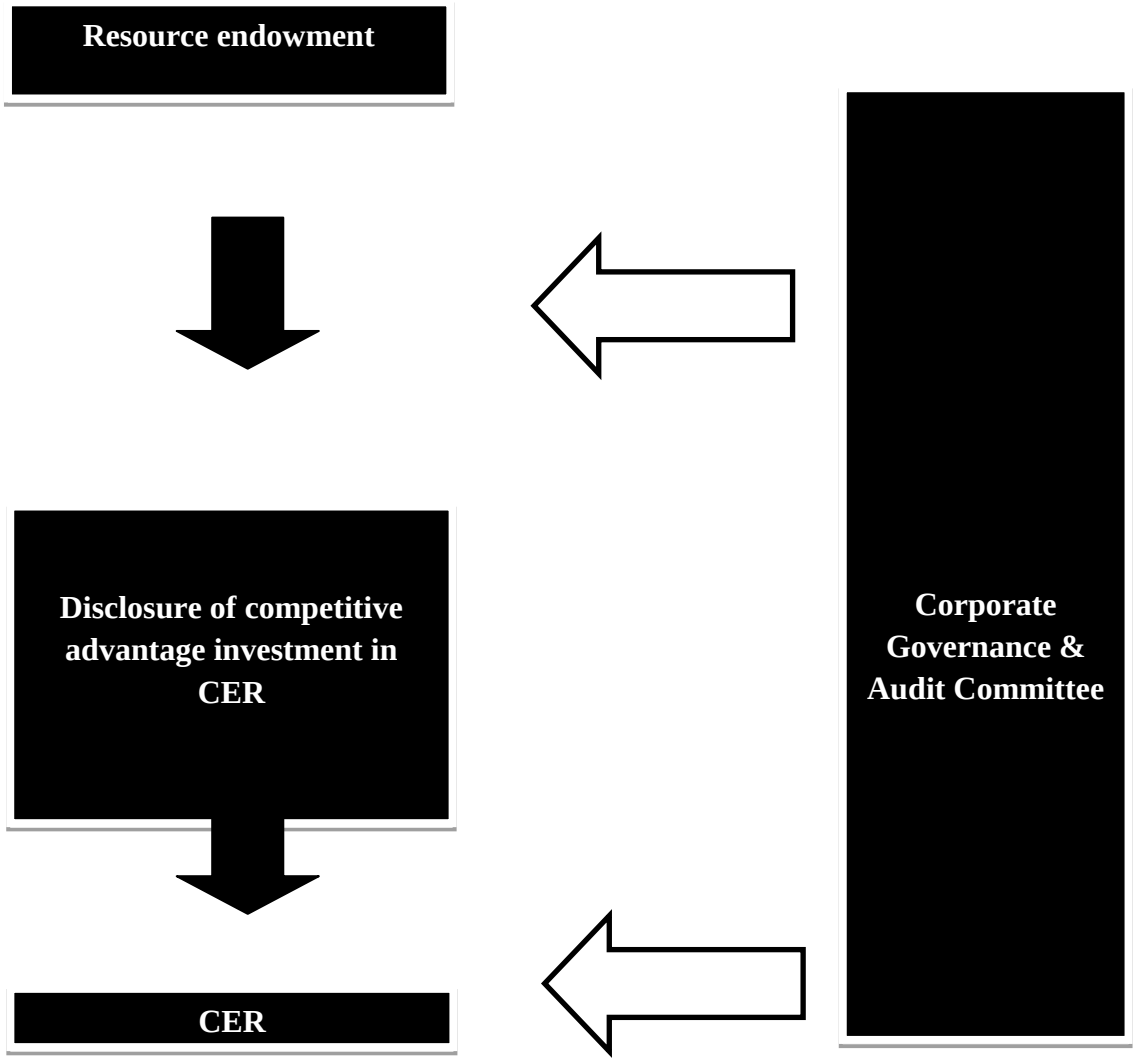
separation of ownership and control. Firm resource endowments and pressure from shareholders may affect managerial capacity to improve new strategies. The firms processes to assimilate, gain and release resources and hence create competitive advantage are moderated by corporate governance. Although investors do not perceive CSR disclosures to be as important as financial matters, Toms (2002) states "environmental disclosures are more likely where investors proactively and continually monitor using voice based governance mechanism" (p.260). According to signalling theory, signals provided must be genuine and difficult to replicate by competitors, therefore they are a strong predictor of managerial behaviour (Toms, 2002).

Annual reports are central corporate documents that speak about the organisation as a whole (Gray et al., 2001: p.350). This leads to the assumption that the most suitable place for signalling disclosures is the annual report, especially considering the unique resources controlled by the firm, and the most valuable method applied to positively transmit the firm specific competitive advantage investments to the market (Toms, 2002). Following Toms (2002), this study is also based on the assumption that reputation can be created and managed through the disclosure process.

This leads to the relationships suggested in Figure 3.1

Figure 3.1

Resource Endowment, Disclosure and CER



In Figure 3.1 resources refers to scale and prior profitability, where, all other things being equal, greater size, giving rise to scale and scope effects, and higher profits provide managers with the resource base to invest in firm specific competitive advantage generating resources. They are likely to do this where suitable projects,

including CSR projects, generate positive NPVs. This is increasingly likely as climate change and pollution abatement technologies affect the basis of competitive advantage (Lash and Wellington, 2007). Competitive advantage investment disclosures refer to those that evidence difficult to replicate investments, and will fulfil that condition where the disclosure is quantitative, specific and therefore audited or auditable. Such disclosures contrast with vague statements of commitment to environmental protection or 'greenwash' that might be made by a competitor unable to afford similar investment.

For the framework to operate effectively, corporate governance and audit committee are essential moderators of the relationships. As noted above, CSR investments should only be made and only enhance competitive advantage where they are positive NPV, and weak governance mechanisms associated with free cash flow will reduce shareholder value because managers are free to make sub-optimal investment decisions (Jensen and Meckling, 1976; Jensen, 1986). Moreover, as suggested in the strategic management literature, if the firm's capability, and specifically its dynamic capability, is defined as the firm's "processes to integrate, reconfigure, gain and release resources, to match and even create market change", (Eisenhardt and Martin, 2000: p.1107) then effective governance processes are necessarily part of the process of generating competitive advantage.

In Figure 3.1, governance and audit are shown as moderating the relationship between resource endowment and disclosure and between the disclosure quality signal and the creation of reputation. Audit is specifically important in these relationships for several reasons. First, because auditable or audited figures disclosed in annual reports are more difficult to replicate; engaging in the audit process is an important part of the generation of competitive advantage. Second, firms are more likely to do this when they are able to access relevant expertise and experience, for example where the firm's audit

committee comprises suitable professionals. Third, the presence of effective audit as part of the governance structure is more likely to lead to support for CSR investments that are positive NPV.

This study examines the impact of disclosures on CER, together with the effects of governance and AC mechanisms, controlling for industry, substantial ownership, systematic risk and size. A specific aspect of these tests is that quality and volume of disclosures are contrasted, where the former refers to difficult to replicate disclosures and the latter to generalised, difficult to verify disclosures. Potential expectation is that the relationships in Figure 3.1 will be stronger for the former than the latter.

When constructing suitable tests of these relationships, in parallel with prior studies, there are modelling issues that must be considered which tend to confound analysis of the links between financial performance, environmental disclosure and environmental reputation (Ullmann, 1985). Considering only financial performance and CSR engagement studies, in a survey of over 120 empirical surveys over a thirty year period, Margolis and Walsh (2003) note the lack of a conclusive relationship, and suggest that they either suffer from measurement problems or fail to deal with causality, endogeneity and omitted variable problems, which are often compounded by inadequate theory. For Ullmann (1985: p.448), the omitted variable is management strategy. Because the RBV quality signalling approach also potentially relies upon all three measures, it too must find solutions to these modelling problems. However, in this approach, CSR activity and disclosure follows from resource endowment, since without such endowments quality signalling of competitive advantage investments is not possible. Moreover, if a qualitative ranking of disclosures is used based on difficulty of replication, it is likely that disclosures measured thus will be an accurate proxy for managerial strategy.

It is also possible that corporate governance corresponds closely to managerial strategy, as accounting disclosure is a function of governance and the governance function can serve to enhance CER. From the CSR literature (Brown and Perry, 1994), CER and the other management reputation indices are uncorrelated and therefore CER is more likely determined by independent and separable aspects of management strategy necessarily expressed through accounting disclosure. Such logic follows from the relationship between managerial strategy and competitive advantage, since managerial action to improve CER will only have reputational consequences if also disclosed outside the firm. Disclosure, if measured in an RBV framework, is therefore a proxy for managerial environmental strategy.

Although this provides a potential theoretical solution to the omitted variable problem, there is no reason why empirical tests should not adopt procedures to identify and control for endogeneity. Even if the above argument is accepted, there are persistent problems associated with reverse causality and joint determination. For example disclosure/managerial strategy may simultaneously lead to enhanced CER and economic performance, or enhanced economic performance may create the resources that allow the managerial strategy to be sustained. These considerations are adapted into models and robustness tests in the results section below.

3.3 HYPOTHESIS DEVELOPMENT

The objective of this study is to extend the studies by Toms (2002) and Hasseldine et al. (2005) to examine whether or not significance can be attributed to variables omitted from these studies and/or measurement of environmental disclosure. Empirical tests of Toms (2002) and Hasseldine et al. (2005) suggest a positive relationship between environmental disclosure and environmental performance measured by reputational scores with mediating variables included such as firm size, industry, systematic risk, substantial ownership, R&D intensity and corporate diversification. Toms (2002) tests the quality signalling aspect using a disclosure level scoring system based on qualitative hierarchy of disclosure adopted from Robertson and Nicholson (1996). The study methodology gives higher qualitative scale to quantifiable and specific disclosure due to the difficulty of imitation, and lesser qualitative scale to general rhetoric which by definition is easier to imitate. Using such a method, the hypothesis of a positive relationship between the quality of environmental disclosure and environmental reputation was supported. Hasseldine et al. (2005) adds the possibility that the quantity of environmental disclosure measured by normal content analysis procedures and environmental reputation are also positively correlated. Results suggest that the quality of environmental information disclosed within corporate annual reports has stronger impact on the creation of environmental reputation rather than mere volume of disclosures.

These studies used a RBV quality-signalling framework similar to the relationships suggested in Figure 3.1. However, they did not consider certain corporate governance variables, particularly the role of audit committee. As the above discussion has made clear, there are good reasons to expect that audit committees add to the quality of environmental disclosure, and by the same virtue increase the CER of the firm by

adding credibility to such disclosures. From the perspective of risk management and financial reporting oversight, ACs may have an important role to play in ensuring these issues receive the attention they require (KPMG, 2010). Understanding the potential impact of ecological, social, and reputational risks are essential elements of risk assessment in a company. ACs should avoid a rule-based approach for addressing these issues, "good behaviour is inspired, not enforced" a note made by Tim Copnell, a founder of KPMG audit committee institute in the UK. There are many implications perceived from anti-social behaviour on a business including risk of raising costs related to higher energy prices and the impact on climate change policy, and damaging the firm's reputation which will have consequences on attracting employees and clients (KPMG, 2010).

AC responsibilities and duties can be summarised as: (i) increasing companies' transparency and encouraging management to disclose more information; (ii) overseeing the quality of reported information which will lead to enhancing the relevance and reliability of the context and content of annual reports; (iii) overseeing the risk management system, i.e. the adequacy and effectiveness of companies' policies and procedures. AC reviews risks associated with CSR on an annual basis and monitors performance through the annual control self-assessment process conducted by internal audit function; (iv) AC should challenge management on key sustainability issues, and the extent to which the risks associated with sustainability and CSR have been identified, assessed and mitigated, and evaluate how the company is incorporating them to suit its own business strategy and governance objectives (KPMG, 2010).

Other reasons have been advanced in the literature to explain why CG mechanisms may have a positive impact on CER. Stakeholder approaches (Calton and Payne, 2003; Harjoto and Jo, 2011) suggest that if managers use effective governance mechanisms

and CSR engagement to resolve conflicts among stakeholders, CSR engagement should also be positively associated with those governance mechanisms. US evidence based on Kinder, Lydenberg and Domini's (KLD) measures suggests that CSR engagement is associated with CG characteristics, including board leadership, board independence, institutional ownership and analyst following (Jo and Harjoto, 2011)

In combination, the resource base of the firm, and its governance effectiveness, specifically the quality of its AC, leads to the hypothesis arising from Figure 3.1:

H: The CER of the firm is positively related to the quality of environmental disclosure and the quality of the AC.

The literature reviewed above is generally supportive of this hypothesis. Because other theories are not associated with enhancement value of assets captured by the firm, for example the conflict resolution role in stakeholder theory suggests a redistribution of value amongst stakeholders; the expectation is that for the RBV quality-signalling approach to be supported, it is necessary that the quality of disclosures is positively associated with CER.

3.4 METHODOLOGY

This section presents the methodology adopted in the conduct of this study. It contains the sample selection, the measurement of variables and model specification.

3.4.1 Sample Selection

All companies that were continuously listed in the UK FTSE 350 in the period 2007 to 2011 inclusive were selected as the initial sample. This created a balanced panel with five years' data per company. Elimination of companies with missing data reduced the sample size to 224 firms in each year with a total firm/year sample size of 1,120 observations. CER is measured using the ratings for that category in the *Management Today* survey of Britain's Most Admired Companies (BMAC) (Salama et al., 2011). In this annual survey, senior executives from 260 British companies and senior specialist business analysts are asked to rate the performance of each company on different characteristics that have an effect on the main stakeholders, including CER (Hasseldine et al., 2005). CER scores were collected for all companies covered by the *Management Today* Britain's Most Admired Companies (MAC) 2007-2011 survey and merged with the initial sample. This resulted in a final sample size of 775 firm observations. Annual reports for these five years 2007-2011 were used to obtain data on community and environmental responsibility disclosures and CG variables. Data for financial variables were collected from *DataStream*.

3.4.2 Independent Variables Definition and Measurement

The position taken in this study is to explain determinants of corporate reputation, how disclosures enhance the external perception of reputation, and the role played by CG practices in interpreting such disclosures. Corporate reputation is the most important

of intangible assets (Toms, 2002), and accounting disclosure is an important channel for the transmission of signals related to these assets. It represents ways on how organisations communicate with society and stakeholders, and management free choice to provide the information needed for the decision making process (Gray et al., 1995). Corporate environmental disclosure has been defined as the preparation and provision of information by management on the impact corporate economic activities have on the physical or natural environment in which they operate for the use of relevant stakeholders in assessing their relationship with the reporting entity (Gray et al., 1993).

Content analysis studies have applied two techniques viz. quantitative and qualitative. Quantitative studies provide information about disclosure volume where data is captured by words (Gao et al., 2005; Campbell, 2003), sentence count (Wilmshurst and Frost, 2000; Perrini, 2005), pages (Unerman, 2000), disclosure frequency (Kolk, 1999), and high/low disclosure ratings (Patten, 1991). The volume of disclosure gives an insight about the importance of such disclosures. However, Cowen et al. (1987) argue that the volume of disclosure alone cannot be used as a proper analysis to decide firm involvement in social responsibility activities due to the fact that the firm may not choose to disclose information about such activities in the annual report. Toms (2002) argues that the volume of environmental information disclosed in UK firms' annual reports is subject to less regulation than in the US. Therefore, it might be more self-congratulatory, less reliable, and insufficient itself to create reputation.

On the other hand, qualitative analysis typically attempts to capture the meaning by disaggregating the narrative into its essential parts and illustrate each part (Beck et al., 2010; Cormier and Gordon, 2001; Wiseman, 1982). It is considered as reliable and descriptive to stakeholders who are more interested in the quality, richness, and the qualitative character of the narrative (Al-Tuwaijri et al., 2004; Beck et al., 2010). To

gain better understanding of its meaning and the richness of that meaning, the qualitative approach tends to give various scores to different levels of social responsibility disclosures. Robertson and Nicholson (1996) use a three-level scoring system based on a qualitative hierarchy of disclosure. The first level in the hierarchy of social responsibility disclosure is the general rhetoric level which relates to corporate acknowledgment of the value of the social responsibility issue. It is considered very general as it is not accompanied by specific objectives and actions. The second level is specific endeavours which consist of CSR initiatives specifically related to the firm and its operating environment. The third level in the hierarchy is implementation and monitoring of programmes related to environmental audit activities or reviews (Robertson and Nicholson, 1996).

Based on Robertson and Nicholson's (1996) hierarchy model, Toms (2002) and Hasseldine et al. (2005) provide a rating scale for social disclosure taking the score of (0) to non-disclosure, (1) to general information, (2) to specific endeavour, policy only, (3) policy specification, (4) implementation and monitoring programmes, (5) quantified results published. Toms (2002) argues that the hierarchy goes in line with the concept of signalling investment in unique resources suggested in RBV as it gives higher scale to quantifiable and verifiable information rather than general rhetoric. Moreover, the quality signalling perspective does not depend on the volume of information; rather it is the credibility of information (signals) that matters.

Disclosure data in this study were collected applying the CONI (Beck et al., 2010) research instrument to environmental disclosures of the sample. CONI applies a matrix instrument of 12 categories (Appendix 1) which increases validity for example by decreasing the likelihood of double coding (Campbell and Abdul Rahman, 2010). A reliability test was run by coders with different experience and academic base in content

analysis and environmental disclosure issues. The alpha co-efficient was calculated according to the method outlined by Krippendorff (1980). Krippendorff alpha value of 87.8% was achieved.

The CONI approach consists of three steps (Beck et al., 2010): *Step 1*- coding content diversity – analysing the narrative of firms' annual reports at the level of phrase or clause; *Step 2*- coding content quality based on five types; and *Step 3*- volumetric measurement – number of disclosure items per category using phrase counts. The five types of disclosure in step 2 provide an indicator of quality of disclosure: Type1- a pure narrative disclosure such as issues related to categories definition; Type 2- a pure narrative disclosure with more details related to disclosure in each category; Type 3- quantitative disclosure addressing issues related to categories mentioned in Appendix 1; Type 4- quantitative and qualitative disclosure of the categories; Type 5- quantitative, qualitative and comparable disclosure. The typology provides a similar method of classifying the quality of disclosures to the one used by Toms (2002) based on the relative difficulty of replication. In the language of CONI and indeed RBV, disclosure of quantitative information is of higher quality than mere narrative because it either cannot be replicated without actual investment at a similar level or can only be claimed through deliberate misstatement.

The resource base was measured using firm size, which is the natural log of total assets (SIZE) and profitability which is a proxy for resource base measured by lag return on equity (ROE_{t-1}). ROE is a potentially endogenous variable as higher disclosure and CER might lead to superior reputation (Ullmann, 1985). The study specifically aims to test the alternative hypothesis that ex ante resources lead to strategies that must be disclosed in order to be valorised in the form of superior reputation. Lagging ROE provides a test of this hypothesis, and also mitigates endogeneity issues. AC quality is

measured in composite fashion to reflect compliance with the recommendations of the Smith Report (2003). Compliance is indicated where all committee members are independent non-executive directors, there are three or more meetings per year, there is at least one committee member with financial expertise and the committee size is greater than three. Prior research has indicated that the interactions of these variables are likely to reflect more strongly than their separate components (Black et al., 2006; Zaman et al., 2011).

Board size measured by the total number of directors is included to reflect the role and effectiveness of the board. Prior literature argues that board size leads to greater attention to CSR activities (Halme and Huse, 1997). Larger boards are more likely to be diverse and include directors with different skills, experience, knowledge and background that are related to different areas including social and environmental responsibility (De Villiers et al., 2011). Larger boards are more likely to assist firms to acquire critical financial resources and initiate new environmental projects that will have an impact on the firm's corporate image (De Villiers et al., 2011). De Villiers et al. (2011: p.1645) state resource-rich directors are more likely to be knowledgable about environmental issues and impacts, and are better placed to ensure that firms pursue positive environmental performance. Including only board size from board variable set helps to avoid the complexity of the testing due to cross-correlation and fixed effects. Time invariant variables can be a cause of apparent insignificance and model specification issues, a point widely recognised in corporate governance research (Roberts and Whited, 2011; Armstrong et al., 2010; Brown et al., 2011; Lim et al., 2007).

Prior literature indicated the potential importance of further variables that were added as controls. The first of these reflects substantial ownership, measured by the

presence of block-holders controlling more than 5% of shares. Although in the general case substantial shareholders have strong incentive to monitor managers (Demsetz and Lehn, 1985; Shleifer and Vishny, 1986), prior research on the relationship between disclosure and CER shows that block ownership reduces reputation, reflecting the reduced influence of institutional investors (Toms, 2002). Graves and Waddock (1994) argue that institutional investors value corporate social and environmental information disclosed by firms, and as a result tend to increase their holdings in these firms. On the other hand, substantial shareholders will increase monitoring of managers' behaviour and this should be associated with disclosing additional information voluntarily such as social and environmental information (Halme and Huse, 1997; Eng and Mak, 2003).

The second control variable, reflecting the influence of debt-holders, is financial leverage. Prior studies (for example Cormier and Magnan, 1999; Naser et al, 2006) find a positive association between leverage and CSR disclosures, arising from increased dependency on capital markets and/or perception of risk. Systematic risk is also an important moderator in reputational building strategies[7]. The higher the risk the more likely a company is to bear poor environmental reputation. High reputation firms, on the other hand, are successful in reducing systematic risk hence lowering the cost of raising equity capital (Toms, 2002). Systematic risk is measured by BETA and obtained from *DataStream*[8]. The final control variable is the allocation of the sample to industry groups, using *DataStream*, Industry Classification Benchmark (ICB) Level 1 industries, creating ten groups that reflect the differing exposure of firms to environmental issues and their management arising from the nature of their activities.

[7] It is worth differentiating between systematic risk and systemic risk to avoid any erroneous reference. Systematic risk refers to overall market risk or undiversifiable risk, whereas systemic risk can be described as a risk caused by an event that can trigger a collapse of an entire financial system.

[8] Because of concerns over its reliability, beta was also calculated by running the market model on a sample of firm observations; results were consistent.

3.4.3 Dependent Variable Definition and Measurement

The dependent variable in this study is corporate environmental reputation. Details of defining and measuring corporate environmental reputation will be provided in the next chapter.

3.4.4 Model Specification

In light of the above discussion, all variables are combined into a regression model to test the relationship between the quality and the quantity of corporate environmental disclosure and corporate environmental reputation. To test the study hypothesis, the following model is used:

$$CER = \beta_0 + \beta_1 ENDISC + \beta_2 SIZE + \beta_3 ROE_{t-1} + \beta_4 ACQUAL + \beta_5 BODSIZE + \beta_6 SUBOWN + \beta_7 LEV + \beta_8 BETA + \beta_9 INDUSTRY + \varepsilon$$

where:

CER = the firm's CER *Management Today* BMAC score

ENDISC = environmental disclosure aggregate score measured using the CONI approach. Two measures were used. First, QUALDISC, which is the highest recorded level achieved in step 2 of the CONI typology. Second VOLDISCV, which is the volumetric measure used as a proxy for total disclosures according to step 3 of the CONI approach.

SIZE = Natural log of total assets

ROE_{t-1} = Prior year return on equity

ACQUAL = 1 [if all AC members are independent non-executive directors and ACMEET ≥3, and ACEXP ≥1, and ACSIZE ≥3], otherwise=0

BODSIZE = number of board members.

SUBOWN = Total percentage of shares held by substantial shareholders (5% or more)

LEV= debt to asset ratio

BETA = systematic risk as measured by the company's beta factor

INDUSTRY = Industry classification

β_0 = intercept

$\beta_1 - \beta_9$= Coefficients

ε error term

3.5 EMPIRICAL ANALYSIS AND RESULTS

3.5.1 Descriptive Statistics

Descriptive statistics are shown in Tables 3.1-3.3. In Table 3.1 mean and distributional characteristics are reported for each of the variables in the above models. Skewness and kurtosis for some variables are of high values indicating that those variables are not normal. Of the continuous variables, ROE_{t-1} demonstrates significant non-normality as a function of the outlying observations which were dealt with by winsorization. The data reported in tables below are after winsorization at the 1% level has been applied to all continuous variables. The mean (median) for environmental reputation score in terms of 'community and environment' (CER) is 5.604 (5.7) which is higher than a mean of 5.5 reported by Toms (2002) but lower than a mean of 5.813 by Hasseldine et al. (2005). Regarding environmental disclosure measures, the mean (median) for disclosure volume is 41.08 (35) and disclosure quality is 3.167 (4). Of the resource base variables, the mean firm size measured by natural log of total assets (SIZE) is 14.95 (14.77), and the mean profitability measured using return on equity ratio (ROE) is 0.240 (0.172).

The mean (median) of systematic risk (BETA) is 1.058 (1.03) which is higher than a mean of 1.01 reported by Toms (2002) and a mean of 0.889 reported by Hasseldine et al. (2005), and the mean (median) for leverage (LEV) is 0.256 (0.240). It is noteworthy that the mean for AC quality (ACQUAL) is 0.834 which is higher than the equivalent figure of 0.16 applied to a sample of UK FTSE 350 companies between 2001-2004 inclusive (Zaman et al., 2011), demonstrating the changes brought about by the Smith Report (2003) recommendation. The mean (median) of board size (BODSIZE) is 9.572 (9), and the mean (median) of substantial ownership (SUBOWN) is 0.247 (0.201).

Table 3.2 reports mean values of key variables by industry. The data shows that the Oil and Gas industry tends to disclose the most by volume and quality of disclosure and firms tend to enjoy relatively high reputations. These firms also have large resource bases in terms of both capital and profitability. Financial services disclose the least on both measures, and these industries illustrate the contrast in relative sensitivity of activities towards the environment. In general, industries disclosing high volume tend to also make high quality disclosures, although not in all cases. Utilities firms for example have high volume disclosures but no correspondingly high quality.

Table 3.1- Descriptive Statistics for Regression Variables

Variable	Mean	Median	Standard Deviation	Minimum	Maximum	Skewness	Kurtosis
CER	5.604	5.7	0.873	2.2	8.3	-0.296	3.471
QUALDISC	3.167	4	1.567	0	5	-0.524	1.784
VOLDISC	41.08	35	33.26	0	162	1.384	4.931
SIZE	14.93	14.75	1.618	11.44	19.55	0.693	3.421
ROE_{t-1}							
ACQUALITY	0.834	1	0.372	0	1	-1.792	4.23
BODSIZE	9.572	9	2.484	4	18	0.694	3.274
SUBOWN	0.246	0.2	0.196	0	0.941	1.239	4.736
LEV	0.256	0.240	0.181	0	1.131	0.629	3.457
BETA	1.05	1.03	0.593	-0.72	4.09	0.669	4.75

CER = 'community and environment' reputation scores published by *Management today* survey**; VOLDISC =** total environmental phrases per coded category using CONI method; **QUALDISC** = qualitative measure of disclosure based on 5 types in CONI; **SIZE =** natural log of total asset; **PROFIT =** return on equity; **ACQUAL** = 1 [if all AC members are independent non-executive directors and ACMEET=>3, and ACEXP=>1, and ACSIZE =>3], otherwise=0; **BODSIZE =** number of members on board**; SUBOWN =** total percentage of substantial shareholding who own 5% or more**; LEV** = debt to asset ratio; **BETA** = systematic risk

Table 3.2- Independent Variables by Industry

Variable	CER	QUALDISC	VOLDISC	SIZE	ROE_{t-1}	ACQUALITY	BOARDSIZE	SUBOWN	LEV	BETA
Oil & Gas	5.723	3.656	70.06	16.108	0.233	0.968	11.406	0.234	0.138	0.975
Basic Materials	5.381	3.097	49.07	15.238	0.191	0.805	9.902	0.271	0.237	1.033
Industrials	5.784	3.373	50.78	14.313	0.242	0.804	8.902	0.216	0.234	1.068
Consumer Goods	5.847	3.041	39.05	14.913	0.322	0.917	9.268	0.246	0.256	1.073
Health Care	5.509	3.190	34.67	15.384	0.251	0.857	10.428	0.157	0.272	1.001
Consumer Services	5.507	3.277	37.47	14.634	0.329	0.782	9.4	0.284	0.307	1.098
Telecommunications	5.103	3.586	41.21	15.336	0.214	0.552	10.517	0.232	0.243	1.068
Utilities	5.721	3.276	53.83	16.154	0.195	0.965	9.862	0.179	0.233	0.995
Financials	5.488	2.431	17.18	15.991	0.130	0.922	10.588	0.226	0.221	1.023
Technology	5.503	3.111	40.55	13.673	0.477	0.852	7.888	0.328	0.085	0.987

CER = 'community and environment' reputation scores published by *Management today* survey**; VOLDISC =** total environmental phrases per coded category using CONI method; **QUALDISC** = qualitative measure of disclosure based on 5 types in CONI; **SIZE =** natural log of total asset; **PROFIT =** return on equity; **ACQUAL** = 1 [if all AC members are independent non-executive directors and ACMEET=>3, and ACEXP=>1, and ACSIZE =>3], otherwise=0; **BODSIZE =** number of members on board**; SUBOWN =** total percentage of substantial shareholding who own 5% or more**; LEV** = debt to asset ratio; **BETA** = systematic risk.

3.5.2 Correlation Matrix

Table 3.3 shows the correlation matrix for all the variables in the models, with Pearson or Spearman coefficients as appropriate. Correlation above 0.8 between independent variables indicates that multicollinearity is present and might affect the results (Haniffa and Cooke, 2005; Gujarati, 1995). Correlation coefficients in Table 3.3 show that collinearity is not present. Moreover, VIF is within acceptable limits (1.28). Table 3.3 shows that environmental reputation is positively correlated with resource base variables viz. SIZE and ROE. Quality disclosure (QUALDISC) is positively correlated with environmental reputation while substantial ownership (SUBOWN) is negatively correlated with reputation. As Table 3.3 shows, there is a high degree of cross-correlation between key variables including governance variables. Time invariant variables are often highly relevant with high expected correlations in the cross-sectional dimension especially with time-varying variables of interest. This means that care is required when constructing models to capture their individual and joint effects.

Table 3.3- Correlation Matrix

Variables	VIF	CER	QUALDISC	VOLDISC	SIZE	ROE_{t-1}	ACQUALITY	BODSIZE	SUBOWN	LEV	BETA
CER		1.00	0.107***	0.008			0.153***	0.2241***			
QUALDISC	1.39		1.00	0.592***	0.138***	0.019	0.103***	0.088**	-0.019	0.039	0.065*
VOLDISC	1.38			1.00	-0.010	0.093**	0.046	0.046	0.053	0.075**	0.023
SIZE	1.83	0.295***			1.00		0.199***	0.626***			
ROE_{t-1}	1.02	0.070*			-0.138***	1.00	-0.019	-0.091**			
ACQUAL	1.06						1.00	0.144***	-0.059	-0.045	0.001
BODSIZE	1.72							1.00	-0.192***	0.039	-0.052
SUBOWN	1.06	-0.289***			-0.187***	-0.093***			1.00		
LEV	1.01	0.068*			0.010	-0.007			-0.029	1.00	
BETA	1.01	-0.002*			-0.059	-0.001			-0.020	0.013	1.00
MEAN VIF	1.28										

*** indicates p<.01, ** p< 0.05, * p< 0.1, applying two tailed tests. Pearson correlation is used for pairs of continuous variables below the diagonal and Spearman correlation for discrete variables above the diagonal.

CER = 'community and environment' reputation scores published by *Management today* survey**; VOLDISC =** total environmental phrases per coded category using CONI method; **QUALDISC** = qualitative measure of disclosure based on 5 types in CONI; **SIZE =** natural log of total asset; **PROFIT =** return on equity; **ACQUAL** = 1 [if all AC members are independent non-executive directors and ACMEET=>3, and ACEXP=>1, and ACSIZE =>3], otherwise=0; **BODSIZE =** number of members on board**; SUBOWN =** total percentage of substantial shareholding who own 5% or more**; LEV** = debt to asset ratio; **BETA** = systematic risk.

3.5.3 Results and Discussion

Results of tests of regression model are shown in Table 3.4. Before running the regression, care is required to mitigate the effects of any potential endogeneity in the regression model. Because the level of disclosure captured by the QUALDISC variable results from managerial decisions about specific investments that are non-replicable, it follows that it is not random and arises as a result of managerial selection. To accommodate the potential effects of selection, a two-step Ordered Probit approach is applied (Chiburis and Lokshin, 2009)[9]. The selection model uses quality score as the dependent variable and ROE_{t-1}, SIZE and IND as the selection variables. The latter specifically impacts on disclosure through selection because industry membership to some degree determines the types of necessary investment in environmental protection. Industry membership does not, on the other hand, directly impact on CER, as the rankings are determined by intra-industry peer group observations. In the two-step approach, the six estimated lambdas are not statistically significant (with p-values of 0.333, 0.157, 0.289, 0.534 0.053 and 0.347). Therefore, rather than take a two-step estimation approach, the determinants of environmental disclosure and of environmental performance are tested separately in turn[10], supported by further tests to deal with potential endogeneity issues as appropriate.

All tests use panel data random effects with robust standard error. Hausman and Breusch-Pagan LM tests confirm this as the correct specification and Durbin-Wu tests confirm the absence of residual endogeneity. It is noteworthy that corporate governance variables are time invariant variables so that their influence cannot be captured by fixed effects model. On the other hand, random effects model is more likely to allow the

[9] Using the .oheckman STATA command

[10] Referring to the first model of the thesis: determinants of environmental disclosures

estimation of time-invariant variables effects (Bai et al., 2004: p.610). Despite the abovementioned, as a further robustness test of endogeneity and to secure additional support of the random effects, the regression models were tested using fixed effects specification. The main regression model is run in parts. The results of the impact of quality and volume disclosures variables and resource variables on reputation are reported in models 3.1, 3.2, 3.3. The effects of adding the governance variables are shown in models 3.4, 3.5.

Model 3.1 and Model 3.2 show that disclosure quality and volume have opposite signs. Model 3.1 shows the impact of quality and volume disclosure variables on environmental reputation. Although significant in this model, VOLDISC has negative sign and therefore no positive association with CER. QUALDISC, as predicted, is positive and significant in all models tested. Model 3.3 confirms that in the absence of quality, volume alone has no effect. A possible interpretation is that volume alone could be interpreted as 'greenwash' in the process of reputation creation. SIZE and SUBOWN are significant in all models, with SIZE taking the predicted positive value. The results suggest that large firms are able to create greater reputation, possibly as a result of resources generally available and as a consequence of their greater ability to make higher quality disclosures.

The significance of SIZE is increased when regressed with the SIZE * SUBOWN interaction variable. SUBOWN is significant with a negative sign, suggesting that blockholders detract from reputation, and the negative sign on the interaction co-efficient suggests that although reputation increases with scale, blockholders detract reputation for any given resource base. This finding is consistent with Toms (2002) suggesting that managers are held more closely to account on environmental reputation by professional institutional investors than by insiders or other block shareholders.

ROE_{t-1} is marginally significant in all models, suggesting that there is a positive direct association between prior profit and reputation. Firms possessing cash and resources are more likely to be able to invest in difficult to replicate CSR projects. It is necessary for such investments to be transmitted positively into firms' reputational capital.

The effects of governance and audit quality are shown in models 3.4 and 3.5. Both models show that BODSIZE and ACQUAL are positively associated with reputation. Table 3.3 shows that ACQUAL is correlated with BODSIZE and SIZE, ACQUAL remains significant in retests of the models without these variables. These results suggest that insofar as large boards contribute to increased reputation, they do so directly and not through the agency of increased disclosures or disclosure quality. Audit quality is associated with increased disclosure and increased reputation. In model 3.5, the joint effect of quality and volume of disclosure is shown in a new variable (QUALVOL), which, though significant, does not add substantially to models that include QUALDISC. It could be interpreted that the investment community anticipates a certain amount of specific and quantifiable information therefore quantity disclosure has no incremental effects on their insight of reputation.

Of the remaining control variables, only IND is significant. Industry effects were referred to in the discussion on Table 3.2 above. LEV and BETA are insignificant in all models tested. Comparing the typical coefficients for the significant variables, the results suggest that SIZE and ACQUAL have approximately four times the effect of QUALDISC. BODSIZE, although significant in all models, has a weaker effect than QUALDISC. Moreover, large firms are able to create greater reputation, possibly as a result of resources generally available and as a consequence of their greater ability to make higher quality disclosures.

Results support the study hypothesis that the firm environmental reputation is determined by the quality of environmental disclosures and the quality of audit committee. Although fixed effects specification reduces the power of the model, results were confirmed and consistent with random effects tests except for BODSIZE.

Table 3.4- CER Determinants

Variable	3. 1		3.2		3. 3		3.4		3.5	
	RE	FE	RE	FE	RE	FE	RE	FE	RE	FE
QUALDISC	0.043**	0.045*	0.043**	0.044*			0.044**	0.045*		
VOLDISC	-0.002*	-0.001	-0.002*	-0.001	-0.001	-0.0002	-0.002	-0.001	-0.006**	-0.005*
QUALVOL									0.001**	0.001*
SIZE	0.188***	0.207**	0.199***	0.214**	0.206***	0.218**	0.160***	0.181*	0.160***	0.179*
ROE_{t-1}	0.219*	0.062	0.224*	0.062	0.211*	0.060	0.236**	0.07	0.220*	0.066
ACQUAL							0.174***	0.152**	0.170***	0.150**
BODSIZE							0.033**	0.024	0.031**	0.021
SUBOWN	-0.627***	-0.282								
LEV	0.186	-0.106	0.185	-0.109	0.174	-0.142	0.204	-0.002	0.211	-0.003
BETA	-0.010	-0.012	-0.011	-0.013	-0.006	-0.007	-0.008	-0.12	-0.008	-0.009
SIZE*SUBOWN			-0.040***	-0.017	-0.040***	-0.017	-0.039***	-0.016	-0.039***	-0.016
IND dummies	Included		Included		Included		Included		Included	
_cons	2.480***	2.510*	2.318***	2.401	2.284***	2.438	2.422***	2.208*	2.567***	2.694*
R-sq	0.216	0.115	0.216	0.114	0.212	0.107	0.229	0.128	0.228	0.127
N	772		772		772		772		772	
Hausman Test	11.71		13.01		13.60		13.45		12.50	
BP-LM	186.03***		185.73***		185.05***		182.88***		184.28***	
Durbin-Wu	0.837									

Heteroscedasticity robust t-statistics reported in parentheses. *** indicates p<.01, ** p< 0.05, * p< 0.1

CER = 'community and environment' reputation scores published by *Management today* survey**; VOLDISC =** total environmental phrases per coded category using CONI method; **QUALDISC** = qualitative measure of disclosure based on 5 types in CONI; **SIZE =** natural log of total asset; **PROFIT =** return on equity; **ACQUAL** = 1 [if all AC members are independent non-executive directors and ACMEET=>3, and ACEXP=>1, and ACSIZE =>3], otherwise=0; **BODSIZE =** number of members on board**; SUBOWN =** total percentage of substantial shareholding who own 5% or more**; LEV** = debt to asset ratio; **BETA** = systematic risk; **INDUSTRY** = industry dummies.

3.6 CONCLUSION

This study uses an RBV and quality signalling approach to examine the determinants of firms' reputation for CSR or specifically CER. It considers the role of environmental disclosures as signals of enhancing environmental behaviour and hence reputation of this field. The study also forms a natural extension of the RBV framework to include governance mechanisms, specifically board size and audit committee moderating effects. Results suggest that in terms of the key competitive advantage asset of firm reputation, this is added by the quality but not volume of disclosures, and the quality of audit committee. The quality of environmental disclosures rather than mere volume has a stronger effect on the creation of environmental reputation. These results are consistent with Toms (2002) and Hasseldine et al. (2005) in terms of signs and significance of the coefficients of disclosure quality variable (QUALDISC).

Volume alone does not appear to offer any help apart from mere rhetoric in creating reputation. It could be interpreted as vague statements of commitment to environmental protection or 'greenwash' that might be made by competitors unable to afford similar investment. Firm reputation is also added by the quality of AC, suggesting that such committees promote reputation directly and through their determination of better quality disclosures. In RBV terms, therefore, audit committee is a competitive advantage asset because its governance skills add directly to reputation and also because it promotes quality disclosures that are difficult for competitors to replicate, thereby signalling firm specific competitive advantage investments to the market. Larger boards also contribute to increased reputation through a direct association between board size and environmental reputation rather than the agency of increased disclosures or disclosure quality.

Another determinant of reputation is firm size that forms a proxy of scale and scope of the firm. Large firms are likely to increase the quality of disclosures because these firms are able to engage in activities that are difficult to replicate by competitors. Prior profitability is also shown to be associated with increased environmental reputation. Although inconsistent with Toms (2002) finding that does not show significant relation of prior profitability, the author argues that the absence of significant results in his survey may be a function of using only two years' data; this study overcomes the timescale issue by extending the sample to cover five years' data. Findings show that firms that possess cash and resources are more likely to be able to invest in difficult to replicate CSR projects. Moreover, results suggest that although reputation increases with scale, blockholders detract from reputation by any given resource base.

Based on this study, two important implications for accounting researchers are, first, mere volume of disclosures is insufficient for signalling facts about environmental strategies. The quality of information provided is an important conduit and of a higher value due to the difficulty of replication by companies not genuinely committed to environmental good practice. Second, the role of ACs could help in assessing CER issues when auditing financial reports. This is based on risk management and financial reporting oversight. Audit assurance, moreover, will help discriminate between true claims and false claims by competitors about commitment to sustainability, so the latter is unlikely to result in added value. The study forms a clear message to managers seeking to promote environmental reputation of their firms that they should pay careful attention to the quality difficult to replicate disclosures rather than mere volume. Such disclosures help to create VRIN assets, such as environmental reputation that leads to competitive advantage. The following chapter will tackle the ongoing debate about whether a good environmental reputation provides firms with competitive advantage

over their rivals and engenders a positive impact on their financial performance, or whether it is linked to additional net costs.

CHAPTER FOUR

THE RELATIONSHIP BETWEEN CORPORATE ENVIRONMENTAL REPUTATION AND FIRM FINANCIAL PERFORMANCE

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4.1 INTRODUCTION

It is important to encourage financial markets to act in a manner less incompatible with social and environmental aims of sustainability and this could be acheived through engendering engagement in social and environmental activities. This chapter investigates the economic impact on a firm of its environmental responsibility performance if I take that to be correlated with and measured by environmental reputation. The relationship between corporate environmental reputation and firm financials has recently drawn the attention of many academics, investors and business leaders (Russo and Fouts, 1997; Murray et al., 2006; Wahba, 2008; Hussainey and salama, 2010). The ongoing debate is about whether a good environmental reputation provides firms with a competitive advantage over their rivals, or whether it is linked to additional net costs. Such debate is of great importance as it has likely implications for the corporate image of cleaner technologies. It is important to encourage financial markets to act in a manner less incompatible with social and environmental aims of sustainability and this could be acheived through engendering engagement in social and environmental activities.

It does appear currently that companies are incorporating social and environmental factors in more strategic practices and decision-making processes which ostensibly help achieve sustainability. Such moves may enhance rather than reduce financial value in at least two ways: they may be associated with economic efficiency gains (e.g. reduced wastage) and they may attract ethical investors and customers who are interested in

supporting sustainable companies, thus pushing up financial value (Van de Velde et al., 2005). Investing in social and environmental activities may generate long-term growth opportunities, for example via energy saving programmes and the developing and improving of more eco-friendly technologies (Van de Velde et al., 2005).

This study shall elaborate further on the potential benefits below. Indicators of social and environmental performance could play a very important role in attracting financial market attention here (Murray et al., 2006). Hussainey and Salama (2010) recommend that accountants and managers should put stress on the completion and improvement of environmental practices due to this being useful information for market participants. Negatives and threats such as global climate change and habitat destruction incur potential risks that need management responsiveness. Thus environmental information can impact on investors' decision-making (Murray et al. (2006). For Van de Velde et al. (2005), "a socially responisble company puts the interests of its shareholders on a par with the social, community and environmental interests of third parties or stakeholders involved in its activities" (p.129). In any event, a question that arises is whether such apparently socially responsible strategies are financially profitable. This study will in its empirical focus examine whether companies investing in environmental initiatives engender an impact on their financial performance, and whether such impact is a positive, negative or neutral.

A positive impact could be explained by the relatively low outlay costs of an environemntal initiative that may be compensated by the benefits. The benefits include potentially better employee morale and productivity benefits (McGuire et al., 1988; Stanwick, 1998). The study stresses here that investment in corporate environmental initiatives helps firms to develop new resources, enhance organisational efficiencies, and build positive reputation and goodwill towards external stakeholders (Orlitzky et

al., 2003). The resource-based view supports the argument that competitive advantage is achieved when firms with organisational and knowledge-based resources can make strategic investment, for example in pollution abatement technologies (Blanco et al., 2009). The firm's ability to collect, control and exploit resources will result in a greater long-term financial performance and competitive advantage (Russo and Fouts, 1997). In the RBV of the firm, firms with intangible assets that are valuable and rare such as environmental reputation (or what lies behind it) enjoy a sustainable competitive advantage that leads to the earning of higher returns.

On the other hand, a negative impact could be explained by the fact that investing in environmental activities incurs costs that will put firms in economic disadvantage when they are better off avoiding such costs (Wahba, 2008). Finally, a neutral impact of recent environmental involvement on financial performance, so that costs and benefits are the same, could be further explained by the fact that firms might invest in environmental initiatives until the point where marginal costs of such investment equal marginal benefits (Elsayed and Paton, 2005).

Overall, research on the association between measures of environmental performance and firm financial performance is generally inconclusive and studies have failed to uncover any consistent relationship. Previous findings have been mixed where a positive, negative or no linkage has been proposed. In terms of econometric methods, the study suggests this may be due to many factors such as model misspecification, differences in the measurement of environmental responsibility and financial performance, and/or limited data (Mcwilliams and Siegel, 2000; Murray et al., 2006).

This study aims to add to academic literature and provide further empirical evidence on the relationship between the environmental performance and the financial performance of companies. The focus is on companies highlighted by the *Management*

Today Britain's Most Admired Companies (MAC) survey in terms of 'community and environmental responsibility' for the recent years 2007-2011. In doing so, this study aims to extend previous literature and address the controversy regarding the impact of environmental performance, taken to correlate with environmental reputation, on firm financial performance. Such controversy relates to the proper role and activities of corporations. For instance, do and should businesses concentrate only on profit making or compromise on profits by extending environmental friendliness?

Empirically, although there has been a lot of work in this area since the 1970s, continuing controversy suggests the need to extend the prior empirical evidence by reference and comparison to the performances of UK companies in recent times. Firm performance is measured using both accounting and market-based measures. Moreover, this study uses a regression method that has been used in longitudinal studies, specifically random/fixed effects panel data analysis with robust standard errors, which helps to control for outliers and firms' unobserved specific effects and consequently to get more valid results (Elsayed and Paton, 2005).

The remainder of this chapter is organised as follows: literature review and hypothesis development; elaboration of reseach method; analysis and discussion of results; concluding comments including reflection on the implications of the analysis.

4.2 LITERATURE REVIEW

Many empirical studies have been made to assess the relationship between corporate social and environmental performance and firm performance (Mcguire et al., 1988; Belkaoui, 1976; Stanwick, 1998; Van Der Laan et al., 2008).

A study by Mcguire et al. (1988) examines the relationship between firms' CSR policies and financial performance. The study argues that there is a relationship between firm prior performance and CSR. Good financial position will motivate firms to be involved in social and environmental activities especially that CSR is not without cost. In contrast, less profitable firms will be less inclined to engage in CSR. The study uses three different measures of financial performance arguing that focusing on different choices of performance variables in studies of CSR could have better impact on the relationship between financial performance and CSR policies rather than concentrating on CSR measures. Financial performance measures used in the study are: (i) accounting-based measures which represent the historical aspect of firm performance; (ii) market-based measures which represent investors' insights of firms' ability to generate profit.

CSR is measured using data from Fortune magazine's annual survey of corporate reputation. This survey covers the largest firms in about 20 industry groups where executives and outside directors and corporate analysts give a scale from 0 (poor) to 10 (excellent) on different attributes including community and environmental responsibility. Results show that accounting-based measures, specifically return on asset (ROA) are significantly related to CSR than market-based measures. A drawback of Mcguire et al.'s (1988) study is that using Fortune ratings as a measure of CSR is considered subjective and could be affected by evaluators' preferences.

A study by Cochran and Wood (1984) extends prior empirical work by using different measures of financial performance and adding additional variables. The study uses a large sample and industry specific control group during two-time periods: 1970-1974 and 1975-1979. Moreover, it controls for average age of corporate asset due to the high correlation between such a variable and CSR. It is found that firms with older assets are less likely engaged in social and environmental activities, especially that regulatory restraints were less severe. Cochran and Wood (1984) applied reputation index as a measure of CSR, and it uses three accounting measures of financial performance viz. operating earnings to asset ratio, operating earnings to sales ratio, and excess market valuation. Results show weak evidence of a positive relationship between financial performance and CSR.

Pava and Krausz (1996) examine time trends to compare the performance of socially responsible firms identified by CEP (The Council of Economic Priorities) over a seven-year period. Financial performance was measured using accounting-based measures, market-based measures and risk measures. Moreover, the study controls for some firms' specific variables such as size, capital intensity, number of lines of business and dividend pay-out ratio. Findings show that socially responsible firms have a financial performance at least at par better than other firms.

Wahba (2008) provides empirical evidence to explore the relationship between corporate environmental responsibility and firm market value in a developing country. The study applies different theoretical perceptions to demonstrate such a relationship viz. stakeholder theory and resource-based view. According to stakeholder theory, a firm's profitability will improve when engaging in environmental projects that satisfy the needs of a variety of stakeholders. This will help the firm to achieve a competitive advantage. The RBV states that the firm that utilises its resources with environmental

awareness will achieve competitive advantage and maximise its returns. Using a sample of 156 firms established in Egypt, environmental responsibility was measured using a binary variable taking the value of 1 if the firm receives an ISO14000 environmental certificate and zero otherwise.

Firm market value was measured by Tobin's q ratio. The study also controls for capital intensity, firm risk, firm age, size, ownership structure and industry. Moreover, the study tests the existence of endogeneity biases by employing Hausman specification test arguing that profitable firms are more likely engaged in environmental activities, and able to allocate resources that serve such matters. Not rejecting the null hypothesis confirms the absence of endogeneity effects. Findings show that the market rewards those firms that care for the environment. However, using environmental certificate as a measure of environmental responsibility might not be the best measure, especially since firms' environmental management system may be determined by other external and internal factors such as customers' contentment needs and export guidelines.

The inconsistency in results in previous research may be due to the missing variables as has been suggested by Mcwilliams and Siegel (2000). The study examines the equation estimated by Waddock and Graves (1997) on the relationship between CSR and firm profitability, and argues that such a relationship is misspecified because it does not include investment in R&D and other factors such as advertising intensity. Investment in R&D is associated with enhancing firms' long-term economic performance and productivity. Moreover, it is highly correlated with investment in social responsible activities because both are linked to product differentiation strategy. The study uses a sample of 524 US firms in the period 1991-1996. It also measures CSR using CSR ratings provided by the firm of Kinder, Lydenberg and Domini (KLD).

Results indicate that the model that incorporates both investment in R&D and other industry factors proves the neutral impact of CSR on firms' financial performance.

Hussainey and Salama (2010) examine the importance of corporate environmental responsibility for investors using CER ratings. It investigates whether corporate environmental responsibility contains value relevant information useful to investors in anticipating future earnings. The study argues that current earnings will not reflect the full image of a firm's value to investors, and hence their decision to purchase firm securities. Other information is also needed, such as firm's environmental behaviour. The study uses the RBV to link between corporate environmental responsibilities and investors' ability in predicting future earnings. Environmental reputation is considered one of the valuable resources that could be utilised in order to achieve a sustainable advantage over a long period of time which will lead to long-term financial performance. A sample of 889 non-financial firms listed on the London Stock Exchange (LSE) during the period 1996-2002 was used. Corporate environmental responsibility is measured using reputational scores of Britain's MAC published by *Management Today* survey. The study concludes that corporate environmental reputation affects investors' decision to anticipate future earnings. It also recommends accountants and managers to stress the completeness and improvement of environmental disclosure practices due to the useful information they provide to market participants.

Van De Velde et al. (2005) investigate whether socially responsible investors incorporating social and environmental issues in their investing policy expect better firm performance and higher returns than traditional ones. They examined whether there is cost involved with incorporating sustainable dimension in firms' investment policy. The study states that there are two sides of the argument regarding the interaction between CSR and financial performance. Socially responsible firms divide their

interests between shareholders and ethical stakeholders which will lead to a decrease in share price. On the other hand, socially responsibly investment could boost shareholder wealth by reducing non-financial risk and generate long-term growth opportunities. The study uses Vigeo CSR ratings of European quoted companies as a measure of CSR. It also performed four portfolios based on firms' total sustainability ratings and divided CSR into different dimensions. Results show that sustainable investment out-performed the market. However, although sustainable investment performed better than traditional investment but not to the extent to be statistically significant, this is due to the short time horizon employed in the study. Therefore, a longer time horizon and other rating scale may enhance the results.

Russo and Fouts (1997) examine the role of environmental policy in creating competitive advantage that allows the firm to capture profit. The study bases its argument on the RBV theory and provides two modes of environmental policy viz. compliance strategy and prevention strategy. The policy choice affects the firm's ability to generate profit. It argues that industry growth moderates the impact of environmental performance on economic performance. The study uses a sample of 243 firms over a two-year period 1991-1992. Environmental performance is measured based on Franklin Research and Development Corporation (FRDC) environmental ratings. It also applies lagging for independent variables to control for causality effect. Firms' financial performance was measured using return on asset, and control variables include growth, size, capital intensity, and advertising intensity that have been prominent in previous literature.

Russo and Fouts (1997) empirically estimate a significant relationship between improved financial results and proactive environmental performance by firms. Findings show that environmental policy allows for modest variations in firms' performance.

Such findings stem from proactive firms being endowed with tangible, intangible, and personnel-based resources. The study concludes that managers need to use renewals and environmental initiatives to improve industry growth and enhance returns to their resources. Such conditions require innovative thinking. The study applies one financial performance measure, i.e. ROA, applying other measures should add validity and robustness to results attained.

Dowell et al. (2000) examine the relation between adopted global environmental standards of a sample of US-based multinational enterprises (MNEs) and their market value. The study argues that US multinational firms that use a single stringent global environmental standard have significantly higher market value than firms that apply either US or other legal standards. Two arguments were made: firms that apply lax environmental standards will endure lower costs, because these slight regulations will lead to lower fines or liabilities. A contradictory view states that firms that don't follow strict regulations will have to pay for the correction of any environmental damage. Higher environmental standards should focus on employee morale and productivity enrichment.

Dowell et al. (2000) control for causality effect between firm market value and adopted environmental standards. Using a sample of US-based firms in the period 1994-1997, the study measures firms' market value using Tobin's q ratio. MNEs' environmental standards were taken from the Investor Responsibility Research Centre (IRRC) Corporate Environmental Profile. Findings prove a positive correlation between environmental standards and firm market value after controlling for industry, R&D intensity, advertising intensity, leverage, and size**.** The study concludes that firms might improve their financial performance by strengthening their environmental conduct with respect to legal requirements. However pressure from regulators might be compensated

if firms enhance their environmental attitude. Regulation compliance complements rather than displacing or absorbing self-organising practices (Blanco et al., 2009).

Van Der Laan et al. (2008) investigate the mechanisms that compose the positive relationship between corporate social performance and firm financial performance. Such a relationship is based on the interaction of the firm with different stakeholder groups. Primary stakeholders are those who have direct exchange relationship with corporations and are subject to explicit contracts, i.e. employees, whereas secondary stakeholders are not subject to explicit contracts or direct exchange relationship, i.e. environmental groups and the local community. The study argues that secondary stakeholders are more concerned with firm social reputation since they do not have direct access to information resources. Therefore, firms need to invest more in reputational capital to deal with secondary stakeholders' demands that are related to corporate financial performance. On the other hand, primary stakeholders have direct exchange with firms. Hence, firms do not need to secure good corporate social image to signal their good relation with primary stakeholders. The relationship between corporate social performance and primary stakeholders is not linked to the firm financial performance. The study measures corporate social performance using KLD ratings for S&P500 firms in the period 1997-2002. Moreover, firm financial performance is measured using return on assets to capture efficiency, and earnings per share to capture effectiveness. After controlling for size and leverage variables, results show that the relationship between corporate social performance and financial performance is based on the nature of the relationship between various stakeholder groups of the firm. Bad corporate social policies have worse impact on firm financial performance than good social policies, especially for secondary stakeholders.

Cohen et al. (1995) argue that the lack of objectivity to evaluate environmental performance is the reason behind the discrepancy in empirical findings. The study reports a new objective data set based on a relatively comprehensive list of S&P500 companies where environmental performance consists of nine different measures; eight of these measures are coming directly from government data, and one is taken from corporate 10-K fillings as required by US Securities and Exchange Commission. Environmental performance is the average of these measures over three year period (1987-1989). Cohen et al. (1995) measure firm financial performance using accounting-based measures viz. return on assets (ROA) and return on equity (ROE) arguing that accounting return can be directly realised by shareholders. They also use market-based performance measures, specifically total return to common shareholders before and after adjustment for risk. Such return represents true gains to shareholders through both dividend paid and appreciated stock prices. Control variables included in this study were size and industry. The study constructs two industry-balanced portfolios, one of "high polluters" and one of "low polluters" during the period 1987-1989. Financial returns of the "high pollution" portfolios were compared to those of "low pollution" portfolios. Results show that there is no penalty in investing in companies that are environmental leaders in their respective industries. Investors who choose to invest in green portfolios were found to do as well and sometimes better than other portfolios.

Mahoney and Roberts (2007) extend the prior large scale of empirical research by examining the potential relationships between corporate social performance (CSP), financial performance, and institutional ownership for a large sample of publicly held Canadian firms. The study applies a CSP database for Canadian firms – the Canadian Social Investment Database (CSID) – that provides a broad set of ratings for each firm across different dimensions of social performance such as community, employees,

environment, international, product and others. Such ratings provide the possibility to test both the overall measure of CSP and individual components of corporate social performance ratings. Thus, this method allows investigation of the impact of each dimension of corporate social performance on the tested relationship between CSP and firm performance.

Mahoney and Roberts (2007) also focus on the behaviour of institutional investors with respect to CSP. They argue that institutional owners tend to make deep analysis and evaluate their alternatives more carefully before making any investment decisions. Mahoney and Roberts (2007) measure firm performance using traditional accounting measures viz. ROE and ROA. They also control for size, industry and leverage. Using a sample of 352 Canadian firms drawn from CSID for the years 1997-2000, no significant relationship between the composite measures of social performance and firm performance was shown. However, significant relationship was found between environment and international dimensions of CSP and firm performance. Also results indicate that institutional investors invest more heavily in firms with higher levels of CSP. This study employs only traditional accounting-based measures of firm performance; using other measures such as market-based performance may enhance the results.

Perrini et al. (2011) examine the link between corporate social performance (CSP) and corporate financial performance (CFP) using the stakeholder-based approach and questioning the consequences of incorporating CSR voluntarily into business operations and relationships with stakeholders. The study argues that academic research has mainly discussed the link between an overall score of CSP and various measures of CFP without examining the underlying drivers of performance impact associated with CSR, i.e. organisational, customer, supply chain, society, natural environment, and

governance. Therefore, it is essential to investigate the organisational, managerial, or market gains related to specific activities in order to understand the outcome of CSR performance. CSR supports firms in the creation of intangible assets and strengthening the firm ability to identify, manage and give value to inimitable resources such as skills, competence, knowledge and innovation, trust, and reputation which will create competitive advantage.

Perrini et al. (2011) adopt the stakeholder lens and emphasize firm-stakeholders interaction towards the impact of CSR on firm performance and its competitiveness. However, giving consideration to the industrial organisation or strategic aspects of CSR is of increasing importance, especially in that there is a paucity of research where such actions establish intangible resources or competences that lead to competitive advantage (Mcwilliams and Siegel, 2011). RBV helps quantify the strategic value of the company engaging in CSR and the impact it has on firms' bottom line and competitive advantage. Such innovative behaviour will create opportunities for more reliable and robust investment.

Heras-Saizarbitoria et al. (2011) examine the relationship between ISO accreditation firms and their financial performance, and the extent that such a relationship can be attributed to causality. The study argues that firms which intend to pursue ISO14001 certification have higher ROA and sales growth indicating the impact of ex-ante selection resources on firms that seek ISO14001 certification. Moreover, there is an ex-post improvement effect on firm financial performance due to the impact that such certification creates, also called treatment effects. The study uses the trade-off hypothesis and stakeholder theory where firm's survival is not only dependent on its shareholders but also the variety of stakeholders. Failure to meet stakeholders' needs and expectations will generate market fears that will increase firm risk premium and

ultimately result in higher costs and decrease in revenues. The authors argue that an environmental management system can provide opportunities to reduce costs and increase revenues where costs are associated with the risk management system and relationship with stakeholders, while revenues can be enhanced through product differentiation and initiating pollution control technology.

Heras-Saizarbitoria et al. (2011) use a six-year time period (2000-2005), and analyse the comparative financial performance of ISO accreditation firms before and after accreditation. The sample is composed of 268 certified firms and 7,232 non-certified firms. Firm performance is measured using ROA and sales growth. Findings prove the selection effects where firms with better financial performance and sales growth become registered to ISO14001. After accreditation, this better performance lasts but is not significantly enhanced by ISO treatment effects. The study argues enhancing firms' reputational image motivates them to use their fund to get accreditation. Environmental performance could be measured using other measures of performance which should provide an additional support to the treatment-effects vs. selection effects.

Soana (2011) examines a possible relationship between corporate social performance (CSP) and corporate financial performance (CFP) in the banking sector and questioned whether the banking sector can be ethical. Therefore, it overcomes the limitations of previous literature that does not measure the ethical behaviour of the banking sector. Banks have started to initiate socially responsible programmes and increasingly focus on safeguarding their reputation in the light of recent financial crisis. The study argues that competitive advantage is related to the firm ethical behaviour and is achieved through sustaining a corporate reputation. CSR contributes to good

reputation by reducing the unforeseen harmful effects of events that as a result affect the firm profitability.

Soana (2011) measures CSP using multidimensional ethical ratings based on interviews and consultation of public documents regarding quantification procedures of ethical ratings used by specialized agencies operating in Italy. Using a sample of 21 international banks and 16 Italian banks rated by different ethical agencies, CFP was measured using both accounting and market-based measures. Results show no statistically significant link between CSP and CFP, and that investment in social initiatives does not lead to financial advantage. However, in spite of the absence of significant evidence, no negative correlation was conducted. The study argues that Italian banks were successful in directing investment ethically without having to stand any financial loss. The absence of certain methods of determination of ethical ratings where CSP is measured based on the receipt of different evaluations from different agencies could affect the results. Therefore, other proxies of corporate social performance (CSP) need to be applied such as reputational measures conducted by *Fortune Magazines*.

Iwata and Okada (2011) examine the relationship between environmental performance and financial performance. They investigate the different characteristics of environmental issues and responses from various markets and stakeholders' behaviour. The fact that social and economic benefits might contradict requires government intervention to solve any implications arise from anti-social behaviour of a firm. However, the existence of a positive relation between CSR and financial performance will allow market mechanisms to solve such implications. The study argues that increasing revenues and reducing costs of environmental activities leads to improving a firm's financial performance. Increasing revenue is sustained through product

differentiation, better access to capital markets, and pollution abatement technologies, while reducing costs is achieved through having a risk management system and control over costs of materials, energy, capital and labour. The study captures two characteristics related to environmental issues, i.e. waste and green gas emission arguing that employing the amount of waste and green gas emission enables us to investigate the differences in the market evaluation of environmental issues. It also argues that the existence of various channels from which environmental performance affects financial performance is behind the mixed findings in prior literature.

Iwata and Okada (2011) use a sample of 268 Japanese manufacturing firms during the period 2004-2008, and apply seven different financial performance measures to clarify how various financial performance indices that reflect different stakeholders' behaviour are influenced by different environmental issues. Data of waste and greenhouse gas emission was taken from the CSR Database in Japan. Results show no significant relation between waste emission and financial performance supporting that condition where firms follow regulations, stakeholders such as stockholders, investors and financial institutions cannot respond to increases or decreases in waste emissions. Results also show that green gas reduction increases long-term financial performance. Therefore, firms addressing global warming issues will anticipate improving their reputational image in the future. The study captures the impact of two characteristics of environmental issues. However, there are other characteristics related to pollution rate, environmental damage, existence of regulators and environmental treaties which also require attention due to the impact they have on firms' future profit.

Hassel et al. (2005) examines how environmental performance impacts the market value of firms in conjunction with financial statement information. It focuses on the value relevance of environmental performance and how it is reflected in the expected

future earnings that determine market value. The current debate on the relationship between environmental performance and market value is divided into two schools: (i) the cost-concerned school where investments in environmental initiatives incur costs that have an adverse impact on market value and firms' earnings; (ii) the value creation school where firms collecting resources towards their environmental agenda help achieve competitive advantage and improve financial returns to investors.

Hassel et al. (2005) use accounting-based valuation model where market value of equity is a function of book value of equity, accounting earning and environmental performance. Environmental performance information was obtained from CaringCompany (CC) Research, an international network that collects information on ethical and environmental behaviour of firms and gives ratings based on different criteria including environmental objectives, implementation of policies, production and service firm-related issues. The study includes only firms that operate in the manufacturing and service sectors arguing that high environmental performance is expected to be more costly for manufacturing firms because they are engaged in activities more sensitive to the environment. Using a sample 337 of Swedish-listed firms during the period 1998-2000, results show a negative relationship between environmental performance and market value of equity indicating that firms highly engaged in environmental programmes are not highly appreciated by investors. Therefore, the study provides support for the cost-based school. However, the sample size applied in the study is small and the time period studied is relatively short where a longitudinal test might affect the results. Moreover, industry classification is crude, and the value relevance of environmental performance in various industries is needed.

Janney and Gove (2011) examine how firms' prior signals regarding ethical behaviour through CSR initiatives may both enrich and exacerbate market reactions. It

extends prior related literature on strategic CSR and reputation, and documents dynamics in the relationship between CSR and financial performance. The study argues that qualitative signals are important due to the fact that it is costly and difficult for lower quality competitors to replicate. The authors investigate the firms' choices in the stock option backdating scandal where several firms tended to falsify the dates of awarded stock options. Backdating refers to awarding stock options on a past date at a prior price, thus lowering the option strike price (Janney and Gove, 2011: p.1567). The study argues that such behaviour is not illegal if it is disclosed prior to the awards. Voluntary disclosure is a strategic decision therefore; managers play a role in reducing information asymmetry by adopting an optimal disclosure policy that needs to prepare investors for possible future bad news, lowering its resultant severity.

Janney and Gove (2011) explore the changes in investors' responses depending on the setting of CSR disclosures that form the corporate identity of the firm. They argue that firms' reputation develops from an accrual of signals with positive signals enhancing the firm reputation, negative signals damaging it, and consistent signals making for stable corporate identity. Using a sample of 80 US publicly-listed firms, results show firms with enhanced overall reputation for CSR are partially safeguarded from scandal exposure. However, if a firm has good governance system that provides an oversight over CSR behaviour, backdating scandal will lead to an adverse market reaction because investors will interpret this mistake as hypocrisy.

Table 4.1 summarises some previous empirical studies on the relation between corporate social and environmental responsibility and financial performance.

Table 4.1

Previous Empirical Studies of the Relation between Corporate Social and Environmental Responsibility and Financial Performance

Author(s)	Corporate social responsibility measure	Financial performance measure	Control variables	sample	Results
(Mcguire et al., 1988)	*Fortune* annual survey of corporate reputation for responsibility to the community and environment	Accounting based measure: ROA, total assets, sales growth, asset growth, op. income growth Market based measure: risk adjusted return , total return Accounting risk measure: debt to assets, op. leverage, S.D. of op. income, S.D. of total return	Beta	98 US firms form *Fortune* most admired companies 1977- 1884	Negative relationship between accounting based risk measures and social responsibility. Op. income growth has a negative correlation, positive relationship between ROA and total assets.
Cohen et al. (1995)	US government data & corporate from 10K fillings that are required by the SEC	Accounting-based measure: ROA, ROE Market based measure: unadjusted total return to shareholders, risk-adjusted total return to shareholders	Size, industry	S&P500 companies divided into two portfolios: high polluters and low polluters 1987-1989	Either no penalty or positive return from green investing)
Diltz (1995)	CEP index(Council on Economic Priorities)	Daily individual stock price return	Beta	159 big-sized US firms from different industries listed by the CEP index 1989-1991	No correlation
Pava and Krausz (1996)	CEP index	Accounting-based measure:	Size, industry	Sample identified by CEP vs.	Socially responsible firms have

		ROA, ROE, EPS Market based measure: market return, P/E ratio, Market/Book ratio Risk based measure: current ratio, quick ratio, debt to equity, interest coverage, beta Others: capital investment, size, number of lines of business, dividend pay-out ratio		matched pairs not identified by CEP 1985-1887, 1989-1991	been shown to have equal financial performance, if not better than other firms.
Russo and Fouts (1997)	Franklin research and Development Corporation (FRDC ratings)	ROA	Industry concentration, industry growth rate, firm growth rate, capital intensity, advertising intensity	243 US firms chosen from FRDC database of environmentally rated firms 1991-1992	Positive correlation
Balabanis et al. (1998)	Rating by NCG- a UK public interest research organization	Accounting based measures: average ROCE, average ROE, average growth rate Market-based measures: average beta, average excess market value	Size, industry	56 British firms in LSE and rated by NCG (new consumer group) 1988-1989, 1990-1994	Negative association between involvement of environmental protection activities and subsequent financial performance
Dowell et al. (2000)	Firms' position regarding international environmental policy derived from investor	Tobin's q	Size, industry, R&D intensity, advertising intensity, leverage,	89 manufacturing and mining firms in S&P500 1994-1997	Past changes in environmental standards predict current changes in

	responsibility research centre (IRRC) Corporate environmental profile		foreign assets/ total assets		market value (positively correlated). Firms applying global environmental standards outperform those applying US or internal standards
Mcwilliams and Siegel (2000)	Dummy variable taken the value of "1" if the company included in Domini 400 social index (DSI 400) and "0" otherwise.	Unspecified	Size, industry, risk, R&D intensity, advertising intensity.	524 US firms in Domini 400 vs. those that are not 1991-1996	No correlation
Van De Velde et al. (2005)	Four portfolios based on total sustainability rating derived from Vigeo Corporate Social Responsibility scores (CSR agency that screens European quoted companies on CSR)	Portfolio return	None	1112 European companies chosen form Vigeo Corporate Social Responsibility Agency 2000-2003	High-sustainability-rated portfolios outperform low sustainability-rated ones
Murray et al. (2006)	UK social and environmental disclosure by the top 100 UK companies derived from the Centre for Social and Environmental Accounting Research (CSEAR)	Share returns	size	UK top 100 companies listed by The *Times 1000*, 1989-1997	No direct relationship between share returns and disclosure, longitudinal data revealed a positive correlation between consistent high/low return and the predicted to high/low disclosure
Mahoney and Roberts (2007)	CSID ratings	ROA ROE	Size, industry, leverage	352 Canadian firms during the period 1997-2000	Positive correlation
Wahba (2008)	Binary variable taken the value of "1" if the company has been certified	Tobin's q	Size, capital intensity, firm risk, firm age, ownership	156 Egyptian firms where 84 firms have an ISO14000 and	Positive correlation

	for ISO14000 environmental certificate published by the Ministry of State Environmental Affairs- Egyptian Environmental Affair agency		structure, industry	the rest are chosen form Egyptian market index published by the Egyptian Capital Market agency (ECMA) 2003-2005	
Hussainey and Salama (2010)	Reputational index of Britain most admired companies(BMAC) published by *Management Today*	Annual stock return, annual earning, EPS, asset growth rate.	None	889 non-financial firms listed on the London Stock Exchange 1996-2004	Positive correlation
Heras-Saizarbitoria et al. (2011)	ISO accreditation	ROA Sales growth	size	268 certified firms and 7232 non-certified firms 2000-2005	Not significant

Researchers have applied different theoretical perspectives to demonstrate the association between corporate environmental performance and firm performance. The RBV focuses on firm performance and provides an analysis on how corporate social and environmental policies impact the bottom line of the firm (Wahba, 2008). Hart (1995) states that "competitive advantage can be sustained only if the capabilities creating the advantage are supported by resources that are not easily duplicated by competitors" (p.988). According to RBV, the firm ability to collect, control and exploit resources such as physical resources, financial assets, reputation, technology, and human resources will result in a greater long-term financial performance and attain competitive advantage (Russo and Fouts, 1997; Hussainey and Salama, 2010).

There are two types of environmental policies developed by Hart (1995) viz. compliance strategy which applies the enforcement of environmental legislation, and prevention policy that emphasises source reduction and process innovation. The firm choice of policy affects its ability to generate profit. These types link the imperative of

capturing competitive advantage with securing social legitimacy through capabilities that facilitate environmentally sustainable economic activities (Hart, 1995). Firms that devote more resources to support their environmental commitment and improve their environmental performance will enhance their value in the market, hence, secure a better financial performance (Wahba, 2008). RBV states that the ability to create unique assets equates reputation with credibility, trustworthiness, reliability and responsibility. These factors endure the value of difficult to replicate assets. Managers need to be aware of the appropriate channels to be used to convincingly convey the details of intangible assets' investments to capital market (Toms, 2002).

Stakeholder theory suggests that firms seek to gain not only stockholders' and bondholders' satisfaction and support, but also other stakeholders' groups such as customers, employees, suppliers, environmental activists and community (Wilmshurst and Frost, 2000). Companies place priorities on some stakeholder groups over others depending on the power they hold over the organisation and their importance as a major resource provider. Hence, failure to satisfy their needs will cause deterioration in the company's performance. Low social responsibility may weaken the image of the firm management where it will be seen as a riskier investment for investors while firms engaged in a high level of social responsibility activities will be exploited to a low level of financial risks and gain credibility from special community groups such as environmental activists and government (Mcguire et al., 1988). Stakeholder theory proposes a positive correlation between corporate environmental responsibility and firm financial performance (Orlitzky et al., 2003). Investment in environmental activities creates opportunities to improve firm financial performance. Moreover, investors who target environmentally responsible firms do not suffer financial penalty (Salama, 2005).

Mcwilliams and Siegel (2001) focus on the supply and demand side when investing in social and environmental activities. They argue that the impact of corporate social and environmental responsibility on profitability will be neutral. This is because firms that devote resources to improve their products' environmental attributes will offer their product at higher prices due to the higher costs involved, while not investing in corporate environmental responsibility will have lower costs and lower prices. Therefore, investment in CSR for a firm will be evaluated by considering the marginal costs and benefits. On the other hand, Walley and Whitehead (1994) suggest that environmental initiatives have financial costs where managers will face a trade-off (at least in the short run) between environmental and financial matters. The study argues that there is a remarkable appeal in the idea that 'green' projects will lead to an increase in profitability.

The expected effect of firm environmental performance on financial performance is inconclusive according to the existing theoretical framework where a positive, negative or no impact have been proposed.

4.3 HYPOTHESIS DEVELOPMENT

Previous research has yielded mixed results. This may be due to many reasons such as lack of theory, issues of measurement and an underspecifying of the model (Mcwilliams and Siegel, 2000, Murray et al., 2006), issues of applying trend analysis, and issues of using different measures of corporate environmental responsibility such as reputational index or content analysis of corporate annual reports. Hence, further research and examination is required in response to such issues. Researchers have hypothesised and have given rational theoretical justification for negative, positive, and neutral links between corporate social and environmental performance and firm financial performance.

Proponents of the positive effects base their argument partly on stakeholders theory and the concept " it pays to be green" (Wahba, 2008; Blanco et al., 2009). The RBV also supports the positive effect of corporate environmental performance in enhancing firm performance and signalling long-term future prospects to market participants (Hussainey and salama, 2010). Firms with intangible assets that are valuable and rare such as environmental reputation enjoy a sustainable competitive advantage that may expect to earn higher returns. Assets that are difficult to replicate may achieve sustained superior financial performance (Roberts and Dowling, 2002). Corporate environmental performance is viewed as a reflecting valuable resource that can be utilised to achieve competitive advantage of the firm over its opponents (Wahba, 2008).

Researchers in line with a positive association argue that the explicit cost of corporate environmental responsibility is minimal and can be compensated by employee morale and productivity benefits (McGuire et al., 1988, Stanwick, 1998). Orlitzky et al. (2003) argue that social and environmental performance is positively correlated with

firm financial performance due to internal and external factors. Firms' engagement in socially and environmentally responsible activities is determined by management decisions, thus it increases managerial capabilities. Moreover, investment in corporate environmental activities helps firms to develop new resources and enhance organisational efficiencies. These resources allow investment in sustainable projects which will influence environmental performance of a firm. Finally the firm will be able to build a positive reputation and goodwill towards external stakeholders.

On the other hand, proponents of a negative association argue that socially responsible firms incur costs that will put them at an economic disadvantage where they are better off avoiding such costs (Wahba, 2008). They argue that positive social and environmental performance causes the firm to incur costs that reduce profits and shareholders wealth (Mahoney and Roberts, 2007). Friedman (1970) argues that the firm social responsibility is to maximise its profits. Pava and Krausz (1996) translate Friedman's position vis-a`-vis the tension between environmental responsibility and profit maximisation: "business managers have a responsibility to shareholders- the owners of the corporation- to maximise firm value. Managers, acting as agents to shareholders, have no mandate to embark on socially- responsible projects that do not enhance the income generating ability of the firm" (p.322). Another argument by Friedman (1970) is that managers are specialised in producing products, selling them, and financing them. They have no competitive advantage in implementing social and environmental programs since they have neither the necessary expertise nor the time needed. A final point stated by Jaggi and Freedman (1992) maintains that the market does not reward corporate environmental responsibility.

Proponents of a neutral impact between corporate environmental performance and corporate financial performance take a position in between the above argument and/or

are theorising of a supply and demand or marginalist economics. Environmentally friendly products will be tendered at higher prices due to higher costs associated with their production while products without environmentally responsible attributes are offered at lower prices (Mcwilliams and Siegel, 2000). Each firm will supply a different amount of social and environmental products based on the unique demands for social and environmental attributes that each firm experiences. At equilibrium, profits will be maximised. Also, at the margin, the benefit of social and environmental production will equal its costs (Mahoney and Roberts, 2007). From the above, there is no clear view regarding the relationship between corporate environmental responsibility and corporate financial performance, and environmental responsibility has always been controversial. There is also an underlying normative or prescriptive debate: should businesses concentrate efforts towards profit or shareholder wealth maximisation (subject to the law) or should they compromise on profits by extending environmental friendliness? Or, in what circumstances should they aim to do one or the other? Descriptively, in this regard, there is a further issue about the relative autonomy of the business corporation vis-a`-vis any trade off.

While there have been several studies assembling the relation between social, environmental and financial performance since the 1970[s,] the above underscores the argument that more empirical work in to a broadly conceived resource-based view of the firm is needed. And UK companies provide an appropriate sample. Social and environmental responsibility activities get great attention in the UK for that UK market is dominated by pension funds and insurance companies which focus on long-term return. Such fact causes CSR to be more integrated in corporate managerial practice due to pressures from market participants (Aguilera et al., 2006). In undertaking such research, the choice between employing accounting-based measures and market-based

measures of firm performance is not without controversy. Accounting measures capture past performance and therefore provide an insight into how firm results historically have been influenced by environmental performance. On the other hand, market measures are forward looking and indicate shareholders' prospects. Combining both measures with appreciation of environmental performance helps incorporating the different prospects. The study explores whether changes of environmental reputation predict current changes in firm financial performance under the assumption gains recognised from greener firm images may be realised in the current year or later. Applying lagging of independent variables will help to control for the possibility of causality effects among our variables and get more valid results (Elsayed and Paton, 2005, Russo and Fouts, 1997).

A resource base analysis of the link between environmental reputation and financial performance leads to the following hypothesis:

H*: there is a positive and significant association between a firm's environmental reputation and its concurrent and subsequent financial performance*

4.4 METHODOLOGY

This section presents the methodology adopted in the conduct of this study. It contains the sample selection, the measurement of variables and model specification.

4.4.1 Sample Selection

All companies that were continuously listed in the UK FTSE 350 in the period 2007-2011 inclusive were selected as the initial sample. Elimination of companies with missing data created a balanced panel with five years' data per company and reduced the sample size to 224 firms in each year with a total firm/year sample size of 1,120 observations. CER is measured using the ratings for that category in the *Management Today* survey of Britain's Most Admired Companies (BMAC) (Salama, Anderson and Toms, 2011). CER scores were collected for all companies covered by *the Management Today* BMAC 2007-2011 survey and merged with the initial sample. This resulted in a sample size of 772 firm observations. Since the study undertakes panel data analysis, and for the purpose of the use of lags of independent variable, we include only those firms with at least two consecutive evaluations over the studied period. This creates a final sample size of 618 firm observations.

4.4.2 Independent Variables Definition and Measurement

For the purposes of testing the main hypotheses of this study, explanatory variables, which attempt to explain the examined relationship, are divided into: (i) the primary causal variable, corporate environmental reputation, and (ii) control variables

4.4.2.1 Defining Corporate Environmental Reputation

Reputation is arguably the most important of intangible assets (Toms, 2002). Good reputation helps the company to operate in a more effective and efficient way and pursue better opportunities. It pays off in both operational and financial terms (Dowling,

2001). Corporate reputations are critical because of the likelihood of value creation, and their intangible properties that make them difficult to replicate (at least in the short term) by competing firms (Roberts and Dowling, 2002; Dowling, 2001; Toms, 2002). Roberts and Dowling (2002) argue that good reputation allows superior financial performance to be sustained over time.

Different stakeholders may have different perspective on the reputation of the same company based on their own economic, social, and personal background (Fombrun, 1996). Corporate reputation has been defined by many researchers. For example, it is defined by Gotsi and Wilson, (2001) as "a stakeholder's overall evaluation of a company over time. This evaluation is based on the stakeholder's direct experience with the company, any other form of communication and symbolism that provides information about the firm's actions and/or a comparison with the actions of other leading rivals" (p.29). In another definition, Fombrun (1996) defines reputation as "a perceptual representation of a company's past actions and future prospects that describe the firm's overall appeal to all its key constituents when compared to other leading rivals" (p.72).

Reputation is also a sign of the quality of a firm's product and services where customers may be willing to pay a premium for them (Roberts and Dowling, 2002). Moreover, a firm with good reputation may also possess a cost advantage due to employees' and suppliers' attitudes towards high reputation firms. Suppliers will be less concerned about contractual hazards accompanied with transactions. Good reputation should also lead to lower contracting and monitoring costs. On the other hand, employees are keen to work harder for good reputation firms and even accept lower remuneration (Roberts and Dowling, 2002).

Based on different views and definitions by researchers of corporate reputation, Salama (2003) defines corporate environmental reputation as "relatively stable, long term and collective judgments by different stakeholders of an organisation's environmental responsibility actions and achievements. If the company minimises (or ideally eliminates) its negative environmental impacts and acts in conformity with environmental expectations, then the stakeholders will develop trust and confidence in that company resulting in a good corporate environmental reputation" (p.206).

4.4.2.2 Measuring Corporate Environmental Reputation

Research studies employ different measures of corporate environmental responsibility (Hussainey and Salama, 2010; Pava and Krausz, 1996). Some studies use questionnaire surveys completed by managers and directors which are then assessed and analysed by experts of corporate policies based on expertise and qualification of those making the evaluation. The level of firm social performance reflects managers' perception of such behaviour (Orlitzky et al., 2003; Soana, 2011). Other studies used pollution emissions as a measure of corporate environmental responsibility (Spicer, 1978). This measure seems to be only valid for certain industries and cannot be generalised to all industries. There are studies that apply ethical ratings, a multi-dimensional index calculated by specialized agencies each given a score which is combined into an aggregate final score (Soana, 2011).

Other researchers use content analysis techniques that measure the amount of social and environmental information published within corporate public documents (Wiseman, 1982; Campbell, 2003). The level of information disclosed is captured by word, page, or sentence count regarding social information, or a quality analysis (Soana, 2011).

Variations in governance structures affect management incentives to inform capital markets about their environmental behaviour (Toms, 2002). Moreover, Verrecchia

(1983) argues that firms may be motivated to both share and hide information regardless of whether the news is good or bad. Toms (2002) tests the quality signalling aspect of corporate disclosure where the credibility of signals provided is more important than the volume of information. Quality signals could be sent to the market using separate environmental reports, kite-mark accreditation, and international environmental standards certification ISO14000. Those measures signalling firms' environmental behaviour are costly to acquire, and difficult to replicate (Toms, 2002).

Finally, researchers also use corporate reputational indices as a measure of corporate environmental responsibility (Mcguire et al., 1988; Diltz, 1995; Jaggi and Freedman, 1992). In this study, the reputational index of Britain's Most Admired Companies which is published in *Management Today* is used as a proxy to measure corporate environmental performance. Despite the degree of subjectivity inherent in the ranking, this method is still one of the most popular methods because of its comprehensiveness and availability (Hussainey and Salama, 2010). Many US surveys have been conducted based on the reputation rankings published annually in *Fortune* magazine to assess corporate social and environmental performance (Mcguire et al., 1988). Karake (1998) states this method has two main advantages. First, it summarises the responses of a key representatives of various firms. Second, it tends to be internally consistent because one evaluator is applying the same (although usually subjective) criteria to each firm. In addition to *Fortune*, reputational ratings are starting to appear in other countries including *Asian Business'* "Asia's Most Admired Companies MAC", *The far Eastern Economic Review's* "Review 200" and *The Financial Times* " Europe Most Respected Companies" (Hussainey and Salama, 2010).

In Britain, a corporate reputation survey has been published in *Management Today* since 1994[11] which applies same methodology as in the US *Fortune* survey. Elsayed and Paton (2005) indicate that "these different types of reputational indices do not refer only to firm community and environmental performance, but are the aggregation of several different evaluation criteria" (p.401). Therefore, researchers get around this problem by using one dimension of various social responsibility aspects viz. *Management Today*'s community and environmental responsibility (CER) scores as a measure of environmental performance rather than the firm's overall score (Elsayed and Paton, 2005; Toms, 2002; Salama et al., 2011). They argue that CER scores are a useful proxy for corporate environmental performance. Elsayed and Paton (2005) argue that CER scores is the only component in the fortune rating that does not seem to be affected by the halo effect generated by financial performance.

The Britain's Most Admired Companies survey is held annually and is based on the opinion of senior executives' from 260 of Britain's largest companies. Financial analysts for each sector are also included in the survey. Senior directors and specialist business analysts are asked in this survey to give a rating between 0 (poor) and 10 (excellent) using nine characteristics, one of which is community and environmental responsibility (Hasseldine et al., 2005), which is used in this study as an empirical proxy for corporate environmental reputation.

4.4.3 Control Variables

In choosing control variables, this study began with a list of control variables that were perceived to act as intervening factors that may have an impact on firm performance and/or social and environmental performance, and therefore should be controlled for in the empirical tests. They are industry concentration, firm size,

[11] It started its first publication in 1989 in the *Economist*.

systematic risk, research and development intensity and advertising intensity. Research and development was dropped from the test because many data were missing causing variables to be consistently insignificant in the trial regression[12]. Firm size (SIZE) is considered one of structure-related variable that have an impact on environmental performance. Balabanis et al. (1998) argue that firm size and environmental impact are inter-correlated. Moreover, Elsayed and Paton (2005) state that "firm size may be relevant for several reasons such as the possible existence of scale economies inherent in environmentally oriented investment" (p.402). Larger firms are highly visible and tend to be subject to increased public pressure; therefore, they are more likely to show better environmental performance in order to fulfil stakeholders' demand (Watts and Zimmerman, 1986). Ullman (1985) argues that larger firms are more likely to have the necessary financial, managerial and technical knowledge required to undertake costly environmental programmes than smaller firms. Firm size is measured by natural logarithm of total assets (Dowell et al., 2000; Elsayed and Paton, 2005).

Systematic risk (beta) is another control variable applied in this study. Firms with a lower level of systematic risk are expected to have a higher level of CSR and higher returns (Balabanis et al., 1998). Low risk companies enjoy good reputation and stability in their stock market returns so they can attract more investors. Investors holding shares in companies with good environmental reputation will require a lower risk adjusted rate of return (Toms, 2002). Systematic risk (beta) is defined by the covariance of the expected return of the stock with that of the overall market divided by the variance of the return of the market. It is the slop of the regression line of the firm returns against market returns (Belkaoui, 1976; Balabanis et al., 1998).

[12] Several other variables commonly used in social and financial performance studies as controls, such as capital intensity and sales growth, were excluded from the final model. These variables did not add to the explanatory power of the model.

Previous literature (e.g. Mcwilliams and Siegel, 2000; Dowell et al., 2000; Elsayed and Paton, 2005) argues that the omission of R&D and advertising intensity from models examining the relationship between social responsibility and firm performance is likely to lead to misleading results. Elsayed and Paton (2005) argue that advertising may help to increase customer consciousness of environmentally friendly products and to prefer them to other products. The study states "advertising can be seen as a signal of the environmental responsiveness of the firm to the market" (p.402). Since no appropriate advertising data are available at the firm level and following Elsayed and Paton (2005), we use the ratio of total intangible assets to total sales to capture the effects of advertising.

The relationship between environmental responsibility and firm market value can also be affected by substantial shareholding (SUBOWN) where diverse institutional ownerships are associated with positive environmental reputation (Toms, 2002; Wahba, 2008). Management are more responsive when shareholdings are dispersed since ethical investors and ethical funds are proactively involved in the monitoring and decision making process of corporate governance, and more likely interested in sustainable projects (Toms, 2002). Substantial ownership is measured by the percentage of outstanding common shares (5%) or more held by substantial shareholders. Finally, another factor that could have an impact on the relationship between environmental performance and financial performance is the type of industries to which firms belong. Different industries display different levels of environmental attributes. Hence, environmental performance may be particularly important in certain industries (Elsayed and Paton, 2005; Mcwilliams and Siegel, 2000). Industry effects are measured by the allocation of the sample to industry groups, using the *DataStream*, Industry Classification Benchmark (ICB) Level 1 industries, creating ten groups that reflect the

differing exposure of firms to environmental issues and their management arising from the nature of their activities.

4.4.4. Dependent Variable Definition and Measurement

Previous research has come up with mixed results regarding the relation between corporate environmental performance and firm performance (Ullmann, 1985; Mcwilliams and Siegel, 2000; Al-Tuwaijri et al., 2004; Freedman and Jaggi, 1988). Measurement of financial performance could be behind such conflicting results. This study will apply both accounting-based measures and market-based measures as proxies of financial performance.

There is a wide literature on the appropriate measurement of financial performance. This study considers four alternative measures of financial performance: return on assets, return on equity, Tobin's q ratio, and share price return. It has been argued that market-based measures are better proxies of firm financial performance for many reasons: they reflect actual shareholders' wealth, and some suggested that share price returns are not subject to managerial manipulation, and that they represent investors' assessment of firms' ability to generate economic profit in the future. On the other hand, accounting-based measures represent an audited historical record of firm financial performance, albeit subject to accounting conventions that may be considered controversial. While market-based measures and accounting-based measures are not without controversy, combining both together in this study adds to the argumentation.

4.4.4.1 Market-based Measures

Tobin's q (Q) ratio (TOBINSQ hereafter) was measured according to Chung and Pruitt (1994) as follows:

[MV (CS) + PS + Debt] / TA where:

MV (CS) is the market value of common stock (share price times the number of shares outstanding).

PS is preferred stock

Debt is the value of short-term liability net of short-term assets plus the book value of long-term debt.

TA is the book value of total assets of the firm (King and Lenox, 2002; Elsayed and Paton, 2005; Wahba, 2008).

Lindenberg and Ross (1981) define Tobin's q (Q) as "the ratio of the firm market value to the replacement cost of its assets". For Q to be meaningful, it requires accurate measures of both firm market value and replacement costs of firm assets (Lindenberg and Ross, 1981). In an equilibrium situation, the Q ratio has a value of 1.0. When Q ratio is more than 1 then the firm market value is higher than the value of the company's recorded assets. This will encourage investors to invest more in the company's capital. While Q ratio lower than 1 suggests that the market may be undervaluing the company hence lower incentive to invest (Kim et al., 1993). Martin (1993) suggests "Q and profitability measures should be regarded as complementary rather than substitutes. Both contain information about market power and there is no compelling reason to think that either type of measure dominates the other" (p.516). For this reason it might be beneficial to consider other measures of performance (Elsayed and Paton, 2005)

Dowell et al. (2000) and Elsayed and Paton (2005) argue that Chung and Pruitt's (1994) simple approximation of TOBINSQ and a more comprehensive estimate for TOBINSQ obtained via Lindenberg and Ross (1981) often yield qualitatively similar results. Dowell et al. (2000) state "the key is whether the use of book – instead of market – value of debt, of inventory, and of plant and equipment introduces any systematic biases; such biases are likely to be linked to industry and firm size" (p.1063).

Since we incorporate both industry effects and firm size in regression model, we should be able to control for any systematic biases.

The second market-based measure applied in this paper is share price return (RETURN hereafter). Financial market responses to environmental responsibility may be measured through share price returns. They help to get a view of whether investors find environmental matters decision useful, in effects examining investor behaviour (Milne and Chan, 1999). Al-Tuwaijri et al. (2004) argue that the annual stock return represents an objective and comprehensive measure of economic performance due to the proposition that stock price should impound information about the firm future prospects from a vast array of both financial and non-financial measures" (p.456).

The academic finance literature generally employs the log-return formulation where return across assets can be easily compared. Brooks (2008) argues that applying the log-return formula has the property of being continuously compounded returns so that the frequency of compounding does not matter. Therefore this formula can be applied whether the study requires annual, monthly or daily stock price (Brooks, 2008). The share price of each company for the year reputational scores have been published and the previous year, are obtained from *DataStream.* RETURN is computed as follow:

$$R_{it} = \ln(P_{it}/P_{it-1})$$

Where R_{it} is the return earned by company (i) in the year t

P_{it} is the share price at the end of year t

P_{it-1} is the share price at the start of year t.

Previous studies have shown no direct relation between share return and environmental responsibility (Diltz, 1995; Murray et al., 2006; Ullmann, 1985).

Therefore, the question of whether share market price is sensitive to social and environmental data has remained unanswered. This study will follow the arguments of Gray et al. (2001) and Murray et al. (2006) that it is more likely for any relationship to reveal itself over a period of time; this helps to better capture environmental performance impact on share price movement.

4.4.4.2 Accounting-based Measures

This chapter will use return on equity (ROE hereafter) and return on asset (ROA hereafter) as a measure of firm performance. Mcguire et al. (1988) argue that accounting-based measures represent only the historical aspect of firm performance. They are subject to managerial manipulation and differences in accounting practices. Moreover, accounting-based measures should be adjusted for risk, industry effects, and other firm variables (Mcguire et al., 1988; Ullmann, 1985). However, Hackston and Milne (1996) argue that measuring firm profitability using ROE and ROA over a trend period is claimed to provide more reliable results. Moreover, Stickney (1995) argues that ROA "takes the particular set of environmental factors and strategic choices made by a firm as given and focuses on the profitability of operations relative to the investments (assets) in place" (p.161).

ROE is measured by the ratio of income available to common shareholders to average amount of common equity. It is argued that ROE should be underlined as a suitable tool for addressing profitability since it is related to cash flows for investors (Pava and Krausz, 1996; Freedman and Jaggi, 1988). ROA is measured by the ratio of income available to common shareholders to total assets. Iwata and Okada (2011) argue that ROE includes stockholders' evaluation and performance of good market while ROA not only includes equity capital contributed by stockholders but also borrowed capital provided by creditors and investors.

Jaggi and Freedman (1992) use ROE and ROA as measures of firm performance on a sample of US firms during the period 1973-1974; no correlation was found between firm performance and environmental responsibility. Balabanis et al. (1998) and Mcguire et al. (1988) show negative correlation between environmental responsibility and firm performance measured using ROE and ROA respectively. Mcguire et al. (1988) argue that accounting-based measures after controlling for risk are more significantly related to corporate social and environmental responsibility than market-based measures, especially that the perception of risk and performance is more firm specific. Moreover, a positive correlation was proved by Russo and Fouts (1997) between firm performance measured using ROA and environmental performance.

4.4.5 Model Specification

In light of the above discussion, the main hypotheses and variables are combined into a multiple regression model to test the impact of corporate environmental reputation on concurrent and subsequent financial performance. The empirical form of the models is set out below.

$$\mathrm{CFP} =$$

$$\beta_0 + \beta_1 \mathrm{CER} + \beta_2 \mathrm{SIZE} + \beta_3 \mathrm{BETA} + \beta_4 ADV + \beta_5 SUBOWN + \beta_6 INDUSTRY + \varepsilon$$

$$\mathrm{CFP}_{t+1} =$$

$$\beta_0 + \beta_1 \mathrm{CER} + \beta_2 \mathrm{SIZE} + \beta_3 \mathrm{BETA} + \beta_4 ADV + \beta_5 SUBOWN + \beta_6 INDUSTRY + \varepsilon$$

where:

CFP = concurrent and subsequent financial performance of a firm as measured by both sets of accounting-based measured and market-based measures.

CER = corporate environmental reputation as measured by the community and environmental responsibility rating for the *Management Today* survey of Britain's MAC.

SIZE = natural log of total assets as a measure of corporate size

BETA = systematic risk as measured by the company's beta factor

ADV = advertising intensity as measured by the ratio of total intangible assets to total sales

SUBOWN = substantial shareholding; the total percentage of shareholders groups with a stake of 5% or more

INDUSTRY = industry classification, SIC code (two digits)

β_0 = intercept

β_1- β_6 = coefficient of slop parameters

ε = error term

4.5 EMPIRICAL ANALYSIS AND RESULTS

This section presents the econometric analysis and results of this study. It contains the descriptive statistics and correlation matrix for all variables in the data set together with regression analyses which are used to test the research hypothesis.

4.5.1 Descriptive Statistics

Descriptive information (mean, median, standard deviation, minimum and maximum values, and skewness and kurtosis) on the dependent and independent variables of interest employed in the current study are presented in Table 4.2 and the coefficient of correlation between the key variables are presented in Table 4.3. Continuous variables viz. ROE, ROA, TOBINSQ, RETURN, SIZE, ADV, and SUBOWN are winsorised (reset) at the 1 per cent and 99 per cent levels; they perform non-normal characteristics although not all at same level. Winsorised regressors are generally more robust to outliers, and variables are less skewed after winsorising (Artiacha et al., 2010).

The mean (median) for accounting-based measures of firm financial performance are: the mean (median) of ROAs (ROA) is 0.076 (0.065) which is higher than a mean of 0.06 reported by Elsayed and Paton (2005) but similar to the mean of 0.08 reported by Van der Laan et al. (2008); the mean (median) of return on equity (ROE) is 0.259 (0.162) which is higher than a mean of 0.088 reported by Balabanis et al. (1998). The mean (median) for market-based measures are: the mean (median) of share price return (RETURN) is 1.55 (1.34) which is higher than a mean of 0.064 reported by Murray et al. (2006) and a mean of 0.08 reported by McGuire et al. (1988). The mean (median) of Tobin's q ratio (TOBINSQ) is 1.235 (1.075) which is lower than a mean of 1.44

reported by Elsayed and Paton (2005) but higher than a mean of 0.825 reported by Wahba (2008).

The mean (median) for environmental reputational score in terms of 'community and environment' (CER) is 5.601 (5.7) which is higher than a mean of 5.5 reported by Salama et al., (2011) and Toms (2002) but lower than a mean of 5.813 reported by Hasseldine et al. (2005). The mean (median) of firm size (SIZE) measured by natural log of total assets is 14.95 (14.77), and it ranges from 11.528 minimum to 19.529 maximum. The mean (median) of advertising intensity (ADV) measured by total intangible assets to sales is 0.354 (0.192) which is higher than the mean of 0.121 reported by Elsayed and Paton (2005). The mean (median) of systematic risk (beta) is 1.058 (1.03) which is higher than a mean of 1.01 reported by Toms (2002) and a mean of 0.889 reported by Hasseldine et al. (2005). Finally, the mean (median) of substantial ownership is 0.247 (0.201). Skewness and kurtosis results show that most of our variables are not normally distributed, which will be discussed in more detail in the following sections.

Table 4.2 - Descriptive Statistics for Financial Performance, Environmental Reputation and Control Variables

Variable	Mean	Median	Standard Deviation	Minimum	Maximum	Skewness	Kurtosis
ROE	0.259	0.162	0.585	-0.442	4.676	5.762	40.75
ROA	0.076	0.065	0.079	-0.151	0.4	1.124	7.194
RETURN	1.55	1.34	1.068	0.043	4.976	0.944	3.579
TOBINSQ	1.235	1.075	0.712	0.079	3.733	1.111	4.266
CER	5.601	5.7	0.881	2.2	8.3	-0.305	3.456
SIZE	14.95	14.77	1.611	11.528	19.529	0.638	3.368
BETA	1.058	1.03	0.593	-0.72	4.09	0.671	4.766
ADV	0.354	0.192	0.479	0	2.351	2.395	9.017
SUBOWN	0.247	0.201	0.198	0	0.947	1.257	4.792

ROE = return on equity; ROA = return on assets; Return = share price return; TOBINSQ = Tobin's q ratio; CER = 'community and environment' reputation scores published by *Management Today* survey; SIZE = firm size measured by log of total assets; BETA = systematic risk; ADV = advertising intensity; SUBOWN = substantial ownership.

4.5.2 Correlation Matrix

The study performs Spearman correlation for all variables included in the system equation since some data shows non-parametric characteristics and is suffering from skewness and kurtosis issue although trying to control it by using winsorised variables. Correlation coefficients are presented in Table 4.3. Correlation above 0.8 between variables indicate that multicollinearity is present and might affect the results (Haniffa and Cooke, 2005; Gujarati, 1995)[13]. Table 4.3 shows that collinearity is not present; the highest correlation is 0.8 between ROE and ROA, these two measures representing firm financial performance and they will be tested separately in the regression test.

The correlation matrix shows a positive correlation between environmental reputation and firm financial performance for all measures applied, i.e. ROE, ROA, TOBINSQ and RETURN. Moreover, firm size measured by the natural log of total asset is positively correlated with firm financial performance for all measures used. Advertising intensity (ADV) is positively correlated with firm financial performance measured by TOBINSQ and RETURN. Substantial ownership (SUBOWN) is negatively correlated with financial performance measured by ROE and ROA and TOBINSQ. Finally, systematic risk (beta) is negatively correlated with firm financial performance measured by TOBINSQ and RETURN. The depicted relations represent consistency with theoretical explanation.

[13] Variance inflation factor (VIF) is within acceptable limits (mean 1.05).

Table 4.3- Spearman Correlation Matrix

Variable	VIF	ROE	ROA	Q	RETURN	CER	SIZE	BETA	SUBOWN	ADV
ROE		1.000								
ROA		0.800***	1.000							
Q		-0.002	-0.035	1.000						
RETURN		0.005	0.024	0.087**	1.000					
CER	1.11	0.119***	0.101***	0.036	0.025	1.000				
SIZE	1.11	0.061*	0.059	0.041	0.110***	0.018	1.000			
BETA	1.02	0.015	0.030	-0.202***	-0.21***	0.026	0.036	1.000		
SUBOWN	1.11	-0.191***	-0.168***	-0.010	0.020	-0.303***	0.009	-0.016	1.000	
ADV	1.03	-0.033	-0.047	0.141***	0.027	-0.042	0.116***	-0.151***	0.031	1.000

*** Correlation is significant at 0.01 levels; **

Correlation is significant at 0.05 levels; *Correlation is significant at 0.1 levels

ROE = return on equity; ROA = return on assets; Return = share price return; TOBINSQ = Tobin's q ratio; CER = 'community and environment' reputation scores published by *Management Today* survey; SIZE = firm size; BETA = systematic risk; ADV = advertising intensity; SUBOWN = substantial ownership.

Table 4.4 examines the study regression variables by industry. The mean variables were compared among industry sectors. Results in Table 4.4 suggest some important industry effects with high means for environmental reputation and corporate financial performance. Firms from the Oil & Gas industry report the highest reputational scores and financial performance for most measures used, specifically ROE, TOBINSQ, and RETURN. On the other hand, firms from the Telecommunication sector report the lowest average environmental reputation score of 5.103 and the lowest ROE, ROA and RETURN, and considerably low TOBINSQ. These results suggest that firms enjoy high environmental reputation and a green image are more profitable.

Table 4.4- Independent Variables by Industry

Variable	ROE	ROA	TOBINSQ	RETURN	CER	SIZE	SUBOWN	ADV	BETA
Oil & Gas	0.220	0.093	1.103	1.704	5.723	14.849	0.268	0.217	0.975
Basic Materials	0.290	0.113	1.422	1.628	5.381	14.493	0.271	0.462	1.033
Industrials	0.207	0.078	1.266	1.576	5.784	15.005	0.216	0.404	1.068
Consumer Goods	0.203	0.052	1.117	1.473	5.847	14.880	0.247	0.348	1.073
Health Care	0.263	0.112	1.164	1.148	5.509	14.742	0.157	0.348	1.001
Consumer Services	0.382	0.075	1.275	1.552	5.507	15.050	0.284	0.323	1.098
Telecommunications	0.161	0.071	1.332	1.395	5.103	14.786	0.237	0.445	1.068
Utilities	0.244	0.074	1.361	1.558	5.721	15.346	0.190	0.358	0.995
Financials	0.151	0.061	1.151	1.558	5.488	14.915	0.227	0.324	1.023
Technology	0.338	0.107	1.151	1.798	5.503	14.927	0.328	0.333	0.987

ROE = return on equity; ROA = return on assets; Return = share price return; TOBINSQ = Tobin's q ratio; CER = 'community and environment' reputation scores published by *Management Today* survey; SIZE = firm size; BETA = systematic risk; ADV = advertising intensity; SUBOWN = substantial ownership

4.5.3 Data Analysis

The analysis of Table 4.2 reveals that winsorising continuous variables moderate, if it does not entirely eliminate, the problem of outliers. This is shown by the skewness and kurtosis issue that these variables suffer from specifically ROE, ROA, and advertising intensity, and the gap between minimum and maximum values of these variables. For Salama (2005) "outliers, which are a common feature in financial performance measures, are troublesome because we want our statistical models to reflect the main body of the data, not just single observations. OLS procedures are influenced strongly by outliers; this means that a single observation can have excessive influence on the fitted model, the significance tests, the prediction intervals, etc." (p.415).

Mcwilliams and Siegel (1997) argue that removing outliers from sample observation under the assumption that these data points reflect noise and measurement errors is problematic. It is possible that outliers provide an important signal of the presence of confounding effects. Added to that, it is not reasonable to remove all outliers from the data set as a solution for outlying cases since most of our financial variables suffer from it. Salama (2005) argues that data transformation and deletion are important tools but should not be viewed as a solution for the outlaying cases. Using robust standard errors, which are known as white corrected standard errors, instead of the traditional standard errors should help reduce the impact of outliers. Salama (2005) states "these estimates are considered robust in the sense that they provide correct standard errors in the presence of unequal variances throughout the population regression line, a condition called heteroscedasticity" (p.417) .

As mentioned previously, ordinary least squared methods (OLS) are influenced strongly by outliers. These methods are likely to be inefficient in finding answers to some economic questions, or bias or both. They might also give false implications (Hussainey and Salama, 2010). Using panel data analysis with robust standard errors should help in solving the outlying case. Hsiao (2003) states "panel data usually give the researchers a large number of data points, increasing the degree of freedom and reducing collinearity among explanatory variables – hence improving the efficiency of econometric estimates" (p.3). Moreover, panel data sets allow controlling for unobservable firm-specific effects which are unlikely to be recognised using pooled data set. Consequently, this should attain more valid results (Elsayed and Paton, 2005; Dowell et al., 2000). Wintoki et al. (2011) argue that panel data estimation can solve the bias arising from unobservable heterogeneity. This study employs the Breusch and Pagan Lagrangian multiplier test (LM) to assign between panel data regression and a simple OLS regression. Results show evidence of significant differences across units, hence the presence of significant firm heterogeneity. Therefore, simple OLS regression is inappropriate and panel data analysis is better to use.

The study applies both fixed effects and random effects estimates. Random effects assume that it is not necessary to estimate a parameter for each firm since firm-specific terms are randomly distributed, while variables in fixed effects estimation behave differently. Hausman test assigns the best estimator to use. A significant value of Hausman test indicates variations of independent variables over time where random effects estimator will be inconsistent and fixed effects estimator is more appropriate (Gujarati, 1995).

The study tests whether corporate environmental reputation and corporate financial performance are jointly determined. Profitable firms will be able to dedicate more

resources to green activities, and build up a good environmental reputation and this will lead to better financial performance (Waddock and Graves, 1997; Wahba, 2008). In the case of endogeneity presence, endogenous variables are expected to be correlated with the error term which will lead to biased results. The study reports the Durbin-Wu test (Hausman, 1978) to investigate the presence of endogeneity (Gujarati, 2003). Not rejecting the null hypothesis that variables are exogenous confirms the absence of endogeneity effects. Durbin-Wu-Hausman results confirm that the hypothesis could not be rejected as the F-test is not significant for each measure of firm performance. Thus, there is no virtuous cycle between corporate environmental reputation and firm performance (Wahba, 2008). Finally the study controls over causality effects by applying lagging of independent variables arguing that investing in environmental initiatives creates competitive advantage and affects the firm's ability to generate profit which is captured at the same year or subsequently (Russo and Fouts, 1997). Panel data provides better analysis to the causality question between environmental performance and financial performance, and assesses the predictive link between the variables of interest (Blanco et al., 2009).

The main objective of the analysis is to investigate the research hypothesis concerning the impact of corporate environmental reputation on concurrent and subsequent financial performance. The main model was run for five separate regressions including both sets of accounting and market-based measures of financial performance during 2007-2011. Results obtained from running static panel data estimates for both fixed effects and random effects are presented in Tables 4.5-4.12 which set out five versions of the model that best summarise the relationship between the environmental reputation of UK firms and their concurrent and subsequent financial performance.

Model 1 shows the results using environmental reputation as the only explanatory variable. Model 2 shows the results including environmental reputation and corporate size, systematic risk, and substantial ownership. Model 3 shows the results including environmental reputation, corporate size, systematic risk, substantial ownership and industry. Model 4 shows the impact of environmental reputation on firm performance when incorporating advertising intensity as the only control variable included in the econometric regression. This helps to test the impact of the inclusion of ADV on the regression model and whether this would affect the impact of environmental reputation on firm performance. Model 5 shows the results when all explanatory variables are included. Such modelling technique helps test the power of various sets of variables in improving the model.

Model 1 presents the static data estimates of firm performance measured using accounting and market-based measures and environmental reputation. The study estimates fixed effects as well as random effects. Results show that environmental reputation is positive and significant with concurrent financial performance for all measures used except for RETURN. When firm performance is measured by ROE, it is positively significant at $p<0.05$ level. Also when it is measured using ROA and TOBINSQ, environmental reputation is positive and significant at $p<0.01$ level. These findings mostly support the hypothesis concerning the positive impact of environmental reputation on concurrent financial performance.

Moreover, results show that the coefficients on lagged reputation are positively significant with firm performance for all measures used at $p<0.01$. Results support the hypothesis in relation to the significant and positive impact of environmental reputation on subsequent financial performance. These findings are consistent with Russo and Fouts (1997) and Dowell et al. (2000) and the win-win perspective whereby

environemtal involvment should improve productivity and profitability. It also provides evidence for the RBV of the firm, that is, the reputation for leadership in environmental affairs is associated with better financial performance. The study results are also consistent with the findings of Hussainey and Salama (2010) that show firms with unique and valuable resources, such as environmental reputation, have an advantage over their rivals in their ability to signal their long-term future outlook to investors. Their study examines the potential usefulness of corporate environmental information to investors in predicting future earning within the framework of RBV theory.

Model 2 presents the results when adding control variables viz. corporate size, systematic risk and substantial shareholding to the relationship between environmental reputation and concurrent and subsequent firm performance. Corporate size is shown to have significant positive impact on firm concurrent and subsequent financial performance when measured by ROE at $p<0.05$ level for both fixed effects and random effects, and on firm concurrent financial performance when measured by RETURN at $p<0.01$ for both fixed and random effects estimator. The study results support the argument that larger firms are more likely to have the knowledge required to undertake costly environmental programmes and show better pollution control to fulfil stakeholders' demands. Systematic risk (BETA) is negatively related to subsequent financial performance when measured by ROE at the $p<0.01$ level for both fixed effects and random effects estimates. When firm performance is measured by TOBINSQ, beta is shown to be significant and negatively correlated with concurrent and subsequent financial performance at $p<0.01$ level, and finally beta is significant and negatively related to concurrent financial performance when measured by stock return (RETURN) at $p<0.01$. These findings supports the argument that firms with a lower level of systematic risk enjoy a good reputation and attract more investors for whom holding

shares in such companies will require lower risk adjusted returns (Balabanis et al., 1998; Toms, 2002).

Substantial shareholdings (SUBOWN) is shown to have a significant and negative impact on concurrent and subsequent financial performance when measured by ROA at the $p<0.10$ and $P<0.01$ level respectively. Moreover when firm performance is measured by TOBINSQ, the substantial shareholding factor is shown to be significantey and negatively impact on concurrent financial performance at $p<0.10$, and on subsequent financial performance at $p<0.10$. This is consistent with the argument that substantial shareholders see corporate environmental responsibility as a long-term strategy with uncertain returns. Reputational scores also remain positively significant, consistent with Model 1 findings.

Model 3 supplements Model 2 with the inclusion of dummy variables for each two-digit industry code for random effects estimates[14]. Environmental reputation is not affected by the inclusion of these variables and remains consistent with Model 1 and Model 2 findings where is shown positive and significant impact on concurrent and subsequent financial performance for all measures used.

Advertising intensity (ADV) is the only control variable included in the econometric specification of Model 4. Mcwilliams and Siegel (2000) argue that economic models used in previous empirical studies were misspecified because they did not control for investment in research and development and advertising projects. Results show that incorporating advertising intensity in the economic model does not affect the significance of coefficients on corporate environmental reputation.

[14] It is not possible to identify the impact of industry effects in the fixed effects model. The existence of dummy variables as part of explanatory variables in the estimated model is considered as an obstacle for the estimating of fixed effects, since the latter is computed by counting dummy variables of N groups in the model (Greene, 2006)

Advertising intensity (ADV) is found to be significant and positively related to concurrent and subsequent firm performance when measured by ROE at the $p<0.05$ and $p<0.01$ level respectively. This variable is shown to have a positive and significant association with concurrent and subsequent financial performance measured by ROA at the $p<0.05$ and $p<0.10$ respectively. Finally, advertising intensity is found to be significant and positively associated with concurrent and subsequent financial performance when measured by Tobin's q at $p<0.05$ for both fixed effects and random effects estimators.

Model 5 tests the full model including all explanatory variables. Results show that there have been positive significant relationships between corporate environmental reputation and economic performance indicators that is ROE, ROA, TOBINSQ. Results on the impact of environmental performance on Tobin's q ratio are consistent with Wahba's (2008) findings when environmental performance exerted a positive and significant impact on the firm market value measured by Tobin's q ratio suggesting that the market compensates those firms that care about their environment. Moreover, our results show that share return (RETURN) is sensitive to past environmental data where reputational scores are shown to have positive and significant impact on subsequent firm performance measured by stock return at the $p<0.01$ level.

Consequently, the hypothesis that there is a positive significant association between corporate environmental reputation and concurrent and subsequent financial performance of the firm is supported. Therefore, based on panel data results reported in this study, it is more likely that good environmental reputation will lead to out-performance. Overall, findings are consistent with the RBV of the firm. According to RBV, corporations looking to regain trust with investors and other stakeholders need to take steps to allocate some resources toward the environmental agenda. This kind of

innovation will push them financially. It provides evidence of how corporate social resources can be seen as valuable tools, difficult to imitate, and are considered to be key to the firm competitive advantage. Intangible resources such as reputation, if utilised, will have an impact on the firm bottom line. They may be the main contributors to the profit and growth of the company (Russo and Fouts, 1997).

Table 4.5- Fixed/ Random Effects Regression of Concurrent Financial Performance on Environmental Reputation and Control Variables (ROE)

Independent	Dependent variable= concurrent financial performance (ROE)									
	MODEL 1		MODEL 2		MODEL 3		MODEL 4		MODEL 5	
	Fixed	Random	Fixed	Random	Fixed	Random	Fixed	Random	Fixed	Random
CER	0.052**	0.048**	0.046*	0.044**	0.046*	0.048**	0.052**	0.048**	0.047*	0.048**
	(2.10)	(2.16)	(1.84)	(2.06)	(1.84)	(2.12)	(2.12)	(2.16)	(1.88)	(2.12)
SIZE			0.024**	0.024**	0.024**	0.023**			0.022**	0.024**
			(2.17)	(2.48)	(2.17)	(2.45)			(2.05)	(2.41)
BETA			-0.006	-0.011	-0.006	-0.011			0.01	0.011
			(0.25)	(0.42)	(0.25)	(0.42)			(0.37)	(0.43)
SUBOWN			-0.057	-0.014	-0.057	-0.048			-0.068	-0.049
			(0.62)	(0.16)	(0.62)	(0.57)			(0.74)	(0.57)
ADV							0.051**	0.012	0.042**	0.005
							(2.50)	(0.75)	(2.21)	(0.31)
INDUSTRY						YES				YES
_cons	-0.031	-0.017	-0.384	-0.366**	-0.384***	-0.399*	-0.050	-0.022	-0.381**	-0.399*
	(0.22)	(0.15)	(2.03)	(2.05)	(2.03)	(1.95)	(0.36)	(0.19)	(2.03)	(1.95)
R-sq	0.005	0.005	0.011	0.013	0.011	0.037	0.002	0.004	0.006	0.036
N	775	775	775	775	775	775	775	775	775	775
Hausman	0.03		0.56		1.06		8.78		7.32	
BP-LM	306.46***		330.94***		275.15***		299.94***		269.95***	
Durbin-Wu	0.974									

*** Correlation is significant at 0.01 levels; ** Correlation is significant at 0.05 levels; *Correlation is significant at 0.1 levels

ROE = return on equity; ROA = return on assets; Return = share price return; TOBINSQ = Tobin's q ratio; CER = 'community and environment' reputation scores published by *Management Today* survey; SIZE = firm size; BETA = systematic risk; ADV = advertising intensity; SUBOWN = substantial ownership; INDUSTRY = industry effect.

Table 4.6- Fixed/ Random Effects Regression of Subsequent Financial Performance on Environmental Reputation and Control Variables (ROE)

Independent	Dependent variable= subsequent financial performance (ROE)									
	MODEL 1		MODEL 2		MODEL 3		MODEL 4		MODEL 5	
	Fixed	Random	Fixed	Random	Fixed	Random	Fixed	Random	Fixed	Random
CER	0.100***	0.112***	0.054**	0.081***	0.054**	0.084***	0.075***	0.108***	0.033*	0.082***
	(3.73)	(4.28)	(2.19)	(3.48)	(2.19)	(3.70)	(3.07)	(4.28)	(1.46)	(3.67)
SIZE			0.074**	0.029**	0.074**	0.029*			0.064**	0.082
			(2.17)	(2.01)	(2.17)	(1.74)			(2.17)	(1.64)
BETA			-0.114***	-0.073***	-0.114***	-0.073***			-0.110**	-0.070***
			(2.69)	(2.76)	(2.69)	(2.78)			(2.55)	(2.65)
SUBOWN			0.102	0.012	0.102	-0.007			0.072	-0.001
			(0.88)	(0.17)	(0.88)	(0.10)			(0.64)	(0.00)
ADV							1.04***	0.096	1.06***	0.121
							(3.64)	(1.00)	(3.83)	(0.94)
INDUSTRY						YES				YES
_cons	-0.282*	-0.355***	-1.052**	-0.556**	-1.051**	-0.626**	-0.385**	-0.357***	-1.024**	-0.605**
	(1.890	(2.61)	(2.03)	(2.14)	(2.03)	(2.09)	(2.49)	(2.61)	(2.21)	(2.02)
R-sq	0.059	0.059	0.051	0.065	0.051	0.087	0.008	0.055	0.019	0.083
N	598	598	598	598	598	598	598	598	598	598
Hausman	0.44		9.29		10.84**		20.29***		30.96***	
BP-LM	177.91***		126.73***		113.74***		177.36***		175.22***	
Durbin-Wu	1.05									

*** Correlation is significant at 0.01 levels; ** Correlation is significant at 0.05 levels; *Correlation is significant at 0.1 levels

ROE = return on equity; ROA = return on assets; Return = share price return; TOBINSQ = Tobin's q ratio; CER = 'community and environment' reputation scores published by *Management Today* survey; SIZE = firm size; BETA = systematic risk; ADV = advertising intensity; SUBOWN = substantial ownership; INDUSTRY = industry effect.

Table 4.7- Fixed/ Random Effects Regression of Concurrent Financial Performance on Environmental Reputation and Control Variables (ROA)

Independent	Dependent variable= concurrent financial performance (ROA)									
	MODEL 1		MODEL 2		MODEL 3		MODEL 4		MODEL 5	
	Fixed	Random	Fixed	Random	Fixed	Random	Fixed	Random	Fixed	Random
CER	0.016***	0.009***	0.015***	0.007**	0.015***	0.008***	0.016***	0.009***	0.016***	0.008***
	(4.56)	(2.95)	(4.37)	(2.40)	(4.37)	(2.70)	(4.59)	(2.95)	(4.14)	(2.71)
SIZE			0.002	0.002	0.002	0.002*			0.002	0.002
			(1.36)	(1.58)	(1.36)	(1.67)			(1.11)	(1.55)
BETA			0.004	0.005	0.004	0.005			0.005	0.006
			(1.17)	(1.57)	(1.17)	(1.66)			(1.33)	(1.74)
SUBOWN			-0.028*	-0.035**	-0.028*	-0.038***			-0.026*	-0.038***
			(1.71)	(2.38)	(1.71)	(2.36)			(1.56)	(2.60)
ADV							0.009**	0.004	0.008**	0.003
							(2.40)	(1.23)	(2.15)	(1.05)
INDUSTRY						YES				YES
_cons	-0.018	0.022	-0.042	0.002	-0.042	-0.011	-0.021	0.021	-0.041	-0.010
	(0.88)	(1.20)	(1.46)	(0.06)	(1.46)	(0.34)	(1.03)	(1.08)	(1.45)	(0.33)
R-sq	0.002	0.002	0.010	0.019	0.010	0.064	0.001	0.001	0.008	0.062
N	775	775	775	775	775	775	775	775	775	775
Hausman	8.30		12.57**		11.09**		16.37***		16.15**	
BP-LM	310.93***		288.99***		257.26***		306.07***		252.75***	
Durbin-Wu	1.95									

*** Correlation is significant at 0.01 levels; ** Correlation is significant at 0.05 levels; *Correlation is significant at 0.1 levels

ROE = return on equity; ROA = return on assets; Return = share price return; TOBINSQ = Tobin's q ratio; CER = 'community and environment' reputation scores published by *Management Today* survey; SIZE = firm size; BETA = systematic risk; ADV = advertising intensity; SUBOWN = substantial ownership; INDUSTRY = industry effect.

Table 4.8- Fixed/ Random Effects Regression of Subsequent Financial Performance on Environmental Reputation and Control Variables (ROA)

Independent	Dependent variable= subsequent financial performance (ROA)									
	MODEL 1		MODEL 2		MODEL 3		MODEL 4		MODEL 5	
	Fixed	Random	Fixed	Random	Fixed	Random	Fixed	Random	Fixed	Random
CER	0.021***	0.020***	0.016**	0.018***	0.016**	0.023***	0.018***	0.020***	0.015**	0.023***
	(2.94)	(3.98)	(2.22)	(3.59)	(2.22)	(4.68)	(2.91)	(4.02)	(2.14)	(4.66)
SIZE			0.006	0.002	0.006	0.004			0.006	0.004
			(0.97)	(0.07)	(0.97)	(1.41)			(0.81)	(1.45)
BETA			-0.004	-0.001	-0.004	-0.001			-0.004	-0.001
			(0.50)	(0.17)	(0.50)	(0.11)			(0.46)	(0.04)
SUBOWN			-0.037	-0.064***	-0.037	-0.067***			-0.039	-0.066***
			(1.51)	(3.36)	(1.51)	(3.48)			(1.64)	(3.42)
ADV							0.098*	0.008	0.092	0.013
							(1.81)	(0.40)	(1.14)	(0.52)
INDUSTRY						YES				YES
_cons	-0.032	-0.031	-0.095	-0.001	-0.095	0.007	-0.042	-0.031	-0.092	0.009
	(0.84)	(1.12)	(0.99)	(0.01)	(0.99)	(0.14)	(1.22)	(1.11)	(0.96)	(0.18)
R-sq	0.034	0.034	0.044	0.062	0.044	0.139	0.008	0.008	0.022	0.139
N	615	615	615	615	615	615	615	615	615	615
Hausman	0.01		4.16		8.52		4.49		10.84	
BP-LM	102.56***		78.87***		42.06***		100.19***		41.80***	
Durbin-Wu	2.03									

*** Correlation is significant at 0.01 levels; ** Correlation is significant at 0.05 levels; *Correlation is significant at 0.1 levels

ROE = return on equity; ROA = return on assets; Return = share price return; TOBINSQ = Tobin's q ratio; CER = 'community and environment' reputation scores published by *Management Today* survey; SIZE = firm size; BETA = systematic risk; ADV = advertising intensity; SUBOWN = substantial ownership; INDUSTRY = industry effect.

Table 4.9- Fixed/ Random Effects Regression of Concurrent Financial Performance on Environmental Reputation and Control Variables (TOBINSQ)

Independent	Dependent variable= concurrent financial performance (TOBINSQ)									
	MODEL 1		MODEL 2		MODEL 3		MODEL 4		MODEL 5	
	Fixed	Random	Fixed	Random	Fixed	Random	Fixed	Random	Fixed	Random
CER	0.082*	0.074***	0.072	0.069**	0.072	0.079***	0.083*	0.076***	0.074	0.081***
	(1.70)	(2.60)	(1.50)	(2.34)	(1.50)	(2.67)	(1.71)	(2.67)	(1.55)	(2.73)
SIZE			0.009	0.008	0.009	0.007			0.004	0.004
			(0.40)	(0.41)	(0.40)	(0.39)			(0.17	(0.22)
BETA			-0.131***	-0.164***	-0.131***	-0.167***			-0.122***	-0.158***
			(2.94)	(3.99)	(2.94)	(4.11)			(2.74)	(3.96)
SUBOWN			-0.361*	-0.051	-0.361*	-0.045			-0.332*	-0.05
			(1.87)	(0.41)	(1.87)	(0.34)			(1.73)	(0.38)
ADV							0.132**	0.124**	0.11*	0.094*
							(1.98)	(2.08)	(1.660	(1.65)
INDUSTRY						YES				YES
_cons	0.773***	0.819***	0.922**	0.911***	0.922**	0.982***	0.724***	0.765***	0.932**	0.983*
	(2.85)	(5.05)	(2.08)	(2.67)	(2.08)	(2.61)	(2.66)	(4.74)	(2.09)	(2.59)
R-sq	0.008	0.008	0.021	0.028	0.021	0.045	0.016	0.016	0.026	0.049
N	775	775	775	775	775	775	775	775	775	775
Hausman	0.04		3.21		3.67		0.08		4.14	
BP-LM	2.28*		1.84*		0.80*		2.24*		0.82*	
Durbin-Wu	0.932									

*** Correlation is significant at 0.01 levels; ** Correlation is significant at 0.05 levels; *Correlation is significant at 0.1 levels

ROE = return on equity; ROA = return on assets; Return = share price return; TOBINSQ = Tobin's q ratio; CER = 'community and environment' reputation scores published by *Management Today* survey; SIZE = firm size; BETA = systematic risk; ADV = advertising intensity; SUBOWN = substantial ownership; INDUSTRY = industry effect.

Table 4.10- Fixed/ Random Effects Regression of Subsequent Financial Performance on Environmental Reputation and Control Variables (TOBINSQ)

Independent	Dependent variable= subsequent financial performance (TOBINSQ)									
	MODEL 1		MODEL 2		MODEL 3		MODEL 4		MODEL 5	
	Fixed	Random	Fixed	Random	Fixed	Random	Fixed	Random	Fixed	Random
CER	0.229***	0.254***	0.168***	0.228***	0.168***	0.225***	0.206***	0.237***	0.150***	0.221***
	(5.23)	(6.95)	(3.74)	(5.98)	(3.74)	(5.69)	(5.20)	(6.55)	(3.49)	(5.63)
SIZE			0.094**	0.003	0.094**	0.003			0.086**	0.001
			(2.39)	(0.10)	(2.39)	(0.11)			(2.24)	(0.02)
BETA			-0.077*	-0.124***	-0.077*	-0.119***			-0.073*	-0.111***
			(1.68)	(3.15)	(1.68)	(2.96)			(1.61)	(2.74)
SUBOWN			-0.014	-0.204*	-0.014	-0.231*			-0.011	-0.222*
			(0.09)	(1.78)	(0.09)	(1.94)			(0.07)	(1.86)
ADV							0.968*	0.500**	0.901*	0.293
							(1.81)	(2.37)	(1.67)	(1.24)
INDUSTRY						YES				YES
_cons	-0.175	-0.300	-1.17**	0.066	-1.17**	-0.119	-0.271	-0.321*	-1.147**	-0.06
	(0.72)	(1.56)	(2.01)	(0.17)	(2.01)	(0.29)	(1.05)	(1.67)	(2.04)	(0.15)
R-sq	0.123	0.123	0.062	0.154	0.062	0.241	0.110	0.134	0.079	0.244
N	615	615	615	615	615	615	615	615	615	615
Hausman	1.60		29.21***		29.78***		4.41		35.88***	
BP-LM	268.08***		212.85***		180.35***		263.44***		175.10***	
Durbin-Wu	0.801									

*** Correlation is significant at 0.01 levels; ** Correlation is significant at 0.05 levels; *Correlation is significant at 0.1 levels

ROE = return on equity; ROA = return on assets; Return = share price return; TOBINSQ = Tobin's q ratio; CER = 'community and environment' reputation scores published by *Management Today* survey; SIZE = firm size; BETA = systematic risk; ADV = advertising intensity; SUBOWN = substantial ownership; INDUSTRY = industry effect.

Table 4.11- Fixed/ Random Effects Regression of Concurrent Financial Performance on Environmental Reputation and Control Variables (RETURN)

Independent	Dependent variable= concurrent financial performance (RETURN)									
	MODEL 1		MODEL 2		MODEL 3		MODEL 4		MODEL 5	
	Fixed	Random	Fixed	Random	Fixed	Random	Fixed	Random	Fixed	Random
CER	0.130*	0.055	0.091	0.063	0.091	0.061	0.131*	0.056	0.092	0.061
	(1.76)	(1.32)	(1.34)	(1.46)	(1.34)	(1.38)	(1.78)	(1.36)	(1.36)	(1.39)
SIZE			0.079**	0.086***	0.079**	0.086***			0.076**	0.085***
			(2.40)	(3.03)	(2.40)	(3.00)			(2.33)	(2.94)
BETA			-0.346***	-0.322***	-0.346***	-0.322***			-0.342***	-0.320***
			(4.57)	(4.92)	(4.57)	(4.90)			(4.50)	(4.85)
SUBOWN			-0.547	-0.329	-0.547	-0.278			-0.533	-0.276
			(1.20)	(1.36)	(1.20)	(1.10)			(1.18)	(1.10)
ADV							0.142	0.094	0.051	0.019
							(1.42)	(1.14)	(0.53)	(0.23)
INDUSTRY						YES				YES
_cons	0.822**	1.243	0.354	0.163	0.354	0.137	0.766*	1.19***	0.358	0.358
	(1.99)	(5.32)	(0.59)	(0.33)	(0.59)	(0.24)	(1.86)	(5.06)	(0.60)	(0.60)
R-sq	0.001	0.001	0.027	0.052	0.027	0.058	0.002	0.002	0.027	0.058
N	749	749	749	749	749	749	749	749	749	749
Hausman	1.43		8.77		8.08		2.28		8.80	
BP-LM	2.82**		2.44**		1.99*		3.14**		1.99*	
Durbin-Wu	2.58									

*** Correlation is significant at 0.01 levels; ** Correlation is significant at 0.05 levels; *Correlation is significant at 0.1 levels

ROE = return on equity; ROA = return on assets; Return = share price return; TOBINSQ = Tobin's q ratio; CER = 'community and environment' reputation scores published by *Management Today* survey; SIZE = firm size; BETA = systematic risk; ADV = advertising intensity; SUBOWN = substantial ownership; INDUSTRY = industry effect.

Table 4.12- Fixed/ Random Effects Regression of Subsequent Financial Performance on Environmental Reputation and Control Variables (RETURN)

Independent	Dependent variable= subsequent financial performance (RETURN)									
	MODEL 1		MODEL 2		MODEL 3		MODEL 4		MODEL 5	
	Fixed	Random	Fixed	Random	Fixed	Random	Fixed	Random	Fixed	Random
CER	0.185***	0.188***	0.155***	0.189***	0.155***	0.183***	0.181***	0.188***	0.152***	0.184***
	(4.51)	(7.98)	(3.44)	(7.36)	(3.44)	(6.95)	(4.37)	(7.98)	(3.330	(6.940
SIZE			0.035	0.006	0.035	0.003			0.034	0.003
			(1.15)	(0.54)	(1.15)	(0.29)			(1.12)	(0.320
BETA			-0.099	-0.013	-0.099	-0.021			-0.099	-0.019
			(1.20)	(0.35)	(1.20)	(0.53)			(1.19)	(0.51)
SUBOWN			-0.098	-0.013	-0.098	-0.008			-0.094	-0.006
			(0.50)	(0.16)	(0.50)	(0.09)			(0.48)	(0.08)
ADV							0.149	0.001	0.139	0.018
							(0.39)	(0.02)	(0.34)	(0.21)
INDUSTRY						YES				YES
_cons	-0.877***	0.897***	-1.158***	-0.792***	-1.15***	-0.814***	-0.892***	-0.897***	-1.154***	-0.811***
	(3.85)	(6.95)	(2.66)	(4.13)	(2.66)	(3.79)	(3.82)	(6.93)	(2.68)	(3.79)
R-sq	0.112	0.112	0.092	0.110	0.092	0.128	0.108	0.112	0.088	0.128
N	615	615	615	615	615	615	615	615	615	615
Hausman	0.01		4.97		4.33		0.21		4.50	
BP-LM	1.29*		1.30		1.06		1.29		1.07	
Durbin-Wu	0.537									

*** Correlation is significant at 0.01 levels; ** Correlation is significant at 0.05 levels; *Correlation is significant at 0.1 levels

ROE = return on equity; ROA = return on assets; Return = share price return; TOBINSQ = Tobin's q ratio; CER = 'community and environment' reputation scores published by *Management Today* survey; SIZE = firm size; BETA = systematic risk; ADV = advertising intensity; SUBOWN = substantial ownership; INDUSTRY = industry effect.

4.6 CONCLUSION

The study provides an empirical investigation based on recent data of the relationship between corporate environmental performance, taken to be correlated with and measured by environmental reputation, and concurrent and subsequent financial performance within the British context. Previous studies have come up with mixed results and this appears to be for many reasons in terms of econometric method: (i) lack of reliable, conventional, and effective definitions of social or environmental performance (Griffin and Mahon, 1997; Mcwilliams and Siegel, 1997); (ii) differences in the measurement of environmental and financial performance (for instance, the use of the event study is likely in this context to give results that are only valid in the short run and they can provide for a perception of the impact of firm environmental attitude only on shareholders rather than all firm stakeholders, Mcwilliams et al., 1999), while they are sensitive to outliers due to the small sample sizes involved, Mcwilliams and Siegel, (1997); (iii) limited data so that relying on a very small sample might not well reflect the relationship between environmental and financial performance; (iv) model misspecification due to omitted variables that might be considered as key factors for profitability.

Research studies have employed different measures of corporate environmental responsibility such as corporate environmental indices (Mcguire et al., 1988; Diltz, 1995; Jaggi and Freedman, 1992), pollution emission (Spicer, 1978), quantitative and qualitative disclosure of environmental information within corporate annual reports (Wiseman, 1982; Campbell, 2003), and *Management Today*'s "community and environmental responsibility" reputation scores (Salama et al., 2011; Hasseldine et al., 2005). The study applies the *Management Today* Britain's Most Admired Companies (MAC) survey method. It uses the *Management Today* evaluation criteria, namely

community and environmental responsibility scores, taking this as a proxy of the environmental performance of UK firms.

The econometric method applied in this study is panel data analysis. Using OLS multiple regression analysis to assess the relation between environmental performance/reputation and profitability is affected largely by outliers and will not be able to capture firms' unobserved effects. Kennedy (1998) argues that outliers can have an impact on standard errors, hypotheses tests, R-square, and other statistics. They perform poorly in the presence of fat-tailed error distributions. Therefore, the study applies panel data analysis with robust standard errors to control for firm heterogeneity and the outlying case, and as a result, has the potential to provide a more powerful evidence base. The variation over time in the environmental measure allows us to control for firm heterogeneity using a fixed effects estimator as well as a random effects estimator. Elsayed and Paton (2005) state that "unfortunately, random effects estimators yield consistent estimates only if we impose the rather strong assumption that firm effects are uncorrelated with the regressors" (p.398).

Panel data results show a positive impact of corporate environmental reputation on firm concurrent and subsequent performance measured by ROE, ROA, and Tobin's q. Results also show that stock return is sensitive to lagged environmental data where a positive and significant relation has been shown between environmental reputation and subsequent financial performance. Findings indicate that larger firms with lower exposed risks are more likely to enjoy a good reputation and engage in environmental programmes that create competitive advantage and enhance their economic value. Moreover, block ownership reduces reputation, reflecting the reduced influence of institutional investors who appear to give greater attention in environmental responsibility and value CER information provided by management. Finally, results

support the role of advertising in enhancing customer awareness of and preference for environmentally friendly products.

Results are in line with the resource-based view of the firm. A perception where a firm's unique resources are considered to be key to its competitive advantage, it offers corporate environmental responsibility researchers a means for refining the analysis of how environmental reputation, as one of the firm's bundle of unique resources, can help the firm to maintain superior long-term financial performance (Hussainey and Salama, 2010). The panel data results reported in this study are important for researchers investigating the relationship between corporate environmental performance and financial performance in the sense that they should pay attention to the methodology applied, and the fact that results attained could be affected by the existence of outliers in the observation sample, heterogeneity effects, and/or limited data.

Moreover, the study results suggests a clear message for managers that they have to develop an environmental policy and build up a green image that attracts not only shareholders but also various environmental stakeholders such as environmental groups, environmental regulators, and the environmental public more generally. Firms allocating resources towards the environmental agenda and developing innovative projects in this regard are achieving higher competitive advantage.

CHAPTER FIVE

CONCLUSION

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5.1 INTRODUCTION

The study examines the relationship between certain corporate governance characteristics and environmental disclosures. The key investigation was focused on audit committee quality and its impact. It investigates the positive impact of resource based firm value and corporate governance (CG) quality specifically effective audit committees on the quality of environmental disclosures. Therefore, the study builds on prior literature that examines the determinants of the volume of disclosures and their quality which include scale, financials and industry effects, by also including the specific impact that audit committee adds to the quality of environmental disclosures. Audited figures disclosed in annual reports are quantifiable, specific and therefore difficult to replicate by competitors.

The study in its second empirical chapter investigates the positive impact of CG quality, audit committees in particular, and the quality of environmental disclosures on corporate environmental reputation using the RBV perspective. Therefore, the positive effect of audit committee quality on environmental disclosures will eventually feed through to environmental reputation and financial performance.

Finally, the study provides an up-to date empirical investigation on the relationship between corporate environmental reputation and corporate financial performance within the British context. The study shows that concern for the environment measured by rated or scored assessments of environmental performance has positive impact on firm financial performance. Therefore, the positive impact goes beyond the trade off point

between environmental concern and financial performance. Resource based view (RBV) supports a positive relation where CSR is a valuable, difficult to replicate, tool. Consequently, CSR here appears key to competitive advantage.

The study uses a sample of UK FTSE 350 companies during the period 2007-2011 and thereby updates the evidence from earlier empirical studies that have shown a stronger impact for higher quality difficult to replicate disclosures (Toms, 2002; Hasseldine et al., 2005). Targeting the FTSE 350 firms ensures both statistical power in the tests and more availability of data. Disclosures in corporate annual reports are measured using the consolidated narrative interrogation instrument (CONI) method (Beck et al., 2010). CONI is based on dual qualitative and volumetric measurement, which is therefore particularly suited to a study of this kind, which requires a measure of disclosure quality that corresponds to the difficulty of replication in terms of VRIN characteristics as well as an aggregate volume measure. As a consequence, this study will be the first to apply the CONI approach to examine CG variables, and related determinants of environmental disclosures. This chapter provides a summary of the study in relation to its main objectives. Its purpose is to briefly summarise the aims and findings of the study in relation to previous research on the relationship between environmental disclosure, environmental reputation and financial performance. It is important to shed light on the limitations to the conducted study as they can provide guidance for the direction of further research. It is noteworthy that understanding limitations of the study helps define its scope. The sections that follow provide a summary of the empirical findings. They also provide an overall conclusion and comprehensive recommendation for future research based on these results. The implications of the findings for managers are also being discussed.

5.2 SYNOPSIS AND FINDINGS

The study is divided into three empirical parts. The first part examines the determinants of environmental disclosure in terms of volume and quality, which include scale, financial, and industry effects, with particular reference to the role of audit committees. In doing so, the study distinguishes between the volume and quality of environmental disclosures using the CONI method by Beck et al., (2010) which is based on dual qualitative and volumetric measurement sufficient to capture the quality and volume of information disclosed. A quantitative measurement is employed based on number of disclosure items per category using phrase counts while a qualitative measure is based on testing type (1-5) disclosures referred in CONI. The typology provides a similar, incremental, hierarchical method of classifying the quality of disclosures to the one used by Toms (2002) that applies thresholds according to relative difficulty of replication.

The study uses RBV and the quality signalling approach to examine the extent that disclosures are determined by the presence of robust governance procedures, including the use of audit committees subsequent to the Smith Report (2003) and the combined code. According to this approach, firms with resource endowments have greater opportunity to invest in strategic investments that create competitive advantage. Managers have a strong incentive to signal the value of their investment using annual report disclosures; such disclosures will help in the creation of reputational assets that are valuable, rare, inimitable, and non-replicable (VRIN), these assets are a source of competitive advantage. Corporate governance mechanisms promote the quality and quantity of accounting disclosures through providing their moderating, monitoring and advising role. Audit committees bringing their accounting and experience to bear will have a positive and important influence on disclosures, including CSR disclosure.

Managers have potentially strong incentives to utilise governance mechanisms in this fashion. As a consequence, effective CG can itself be a source of competitive advantage, and it follows that effective AC is essential for effective governance (Zaman et al., 2011). Auditable or audited figures disclosed in annual reports are more difficult to replicate; engaging the audit process is an important part of the generation of competitive advantage, and the presence of AC as part of governance structure is more likely to lead to support CSR strategies that are positive NPV. The study proposes that where firms create high quality AC, the apparent relationship and specifically how audit quality impacts on disclosure practice will be reinforced.

The empirical findings show that larger firms with higher quality AC make higher quality and volume of disclosures. Larger firms with block shareholders tend to have a greater volume of disclosures but not higher quality. Larger boards have no role in promoting the volume or quality of disclosures. These results show some support for the RBV quality signalling approach. Larger firms possess a greater resource base and, therefore, have the ability to invest in non-replicable CSR strategies. These firms do not merely increase the volume of disclosures, as might be predicted by the political cost and legitimacy approaches, but also the quality of disclosures, where such disclosures are less easily replicated by weaker competitors. Audit committee, which possess Smith Report compliant features, also promote quality disclosure, which is not as strongly achieved by increasing the size and therefore the expertise of the board.

A notable feature of the results was the lack of significance of individual governance variables, either as features of AC or the board. It could be concluded that Smith recommendations are only effective in combination. The composite fashion of AC quality reflects compliance with Smith Report (2003) features. Moreover, it could be because accounting expertise does not individually enhance corporate environmental

responsibility, then accounting skills and training are not useful for promoting this kind of practice or that board diversity has no effect. The time invariant character that many of these variables enjoy can be a cause of apparent insignificance and model specification issues which require caution when interpreting the results and coming to conclusion.

The second part of the study examines the role of environmental disclosures in the creation and sustenance of firms' reputation for their community and environmental performance. It therefore compares the impact of volume of environmental disclosure with the effects of specific quality signals on firms' environmental reputation. The study updates the evidence from earlier empirical studies that have shown a stronger impact for higher quality, difficult to replicate disclosures (Toms, 2002; Hasseldine et al., 2005). These studies did not consider certain corporate governance variables, particularly the role of audit committee in reputational capital creation. There are good reasons to expect that ACs add to the quality of environmental disclosures and by the same virtue increase firm environmental reputation.

In parallel with previous studies, there are modelling issues that must be considered which tend to confound analysis of the links between financial performance, environmental disclosures and environmental reputation where these relationships suffer from measurement problem, fail to deal with causality, and omitted variables problem, which are often compounded by inadequate theory. Due to the fact that RBV also potentially relies upon all three measures, it must also find a solution to these modelling problems. Firms with resource endowments will be able to engage in strategic investment including CSR investment. Without such endowment, these investments are not possible. Moreover, if a qualitative ranking of disclosures is used based on difficulty of replication, it is likely that disclosures measured thus will be an accurate proxy for

managerial strategy, and it follows that environmental reputation is an outcome for managerial strategy. Accounting disclosures is a function of CG that serves to enhance reputation; therefore CG also corresponds closely to managerial strategy.

Although this provides a potential theoretical solution to the omitted variable problem, the study adopts procedures to identify and control for endogeneity. Since the level of disclosure captured by quality disclosure results from managerial decisions about specific inimitable investments, it follows that it is not random and arises as a result of managerial selection. The study applies a two-step ordered-Probit approach to accommodate the potential selection bias. The selection model uses quality disclosure scores as the dependent variable, and financial, size, and industry as the selection variables. A possibility that these variables impact on disclosure through selection is more likely. The absence of significant lambdas in the two-step approach confirms that it is appropriate to test the determinants of environmental disclosure and environmental reputation separately in turn rather than taking a two-step estimation approach. Further tests to deal with potential endogeneity issues are also adopted.

Results suggest that firm reputation is added by the quality but not the volume of disclosure, and the quality of AC. The quality of environmental disclosures, rather than mere volume, has a stronger effect on the creation of environmental reputation. These results are consistent with the findings of Toms (2002) and Hasseldine et al. (2005) on more recent data, and also suggest that quality signalling does not depend on the volume of environmental information; rather it is the credibility of signals that is important. On the other hand, volume alone does not appear to offer any help than mere rhetoric in reputation creation. Firm reputation is also added by the quality of AC. In RBV terms, therefore, audit committee is a competitive advantage asset because its governance skills add directly to reputation, also because it promotes quality disclosures that are

difficult for competitors to replicate, therefore signalling the firm specific competitive advantage investment to the market.

The third part of the study provides an up-to-date empirical investigation of the relationship between corporate environmental reputation and concurrent and subsequent financial performance within the British context. Previous literature has come with mixed results due to methodological differences in the measurement of environmental and financial performance, limited data, and/or model specification issues. This study is documented and analysed in terms of methodology applied and findings. The econometric methodology applied in this study is panel data analysis with robust standard error. Using OLS regression analysis to assess the influence of different factors (amongst them environmental performance) on firm profitability is affected largely by outliers and will not be able to capture firm unobserved effects. Outliers perform poorly in the presence of fat-tailed error distribution (Kennedy, 1998).

Panel data allows controlling for firm heterogeneity. It helps improve model efficiency by using data with more variability and less collinearity. Moreover, panel data is better able to study the dynamics of adjustments where cross-sectional distributions that look relatively stable may suffer from a large amount of variation (Baltagi, 2001). The study employs accounting-based measures of firm performance that provide an insight on firm historical performance, and market-based measures that are forward looking and capture shareholders' prospects.

Results support the resource-based view perspective where firms' unique resources are considered to be key to its competitive advantage that helps to enhance the firm long-term financial performance. According to Mcwilliams and Siegel (2011), CSR attributes, such as alternative-fuel energy, and actions such as recycling and pollution

abatement are RBV resources that create competitive advantage. Results show a positive impact of corporate environmental reputation on firm financial performance. Moreover, findings indicate that larger firms with lower exposed risks are more likely to enjoy good reputation and engage in environmental programmes that create competitive advantage and enhance economic value.

5.3 IMPLICATIONS OF THE STUDY

The results in this study have implications for managers and researchers. In terms of disclosure practices, it is noteworthy that mere volume of disclosures is insufficient for signalling facts about environmental strategies. The quality of information provided is an important conduit and of a higher value due to the difficulty of replication by companies not genuinely committed to environmental good practice. Companies need to reduce their exposure to environmental risks by mitigating, evaluating and managing these risks while seizing new opportunities (Lash and Wellington, 2007), for example taking the lead in certain environmental initiatives such as developing low carbon technologies and climate change policies. They also need to provide quantifiable, specific and inimitable signals to investors, customers and employees about their environmental behaviour, for example quantifying carbon foot print, and arrange inventory with an accurate account of firm's green gas emission. Those signals will enhance firm reputation, boost its earning, and consequently achieve competitive advantage. Therefore "doing well by doing good" will not be enough: you have to be better at it than your competitor (Lash and Wellington, 2007: p.8), and you need to know how to signal efficiently your innovative behaviour to the market.

The study, moreover, contributes to the effectiveness of corporate mechanisms by providing evidence of UK firms on the impact of effective audit committees in improving environmental practices. Although social and environmental reporting is not mandatory, it eventually could become a standard aspect of the company's annual report. Corporate Responsibility Reporting in a survey made by KPMG in 2008 indicates that 80 per cent of Global 250 companies report on corporate responsibility issues in some form. Although CSR and sustainability were viewed as extras, an increasing number of firms now perceive them as fundamental elements in their

business strategy and their risk assessment effort (KPMG, 2010). Another survey by KPMG Global Audit Committee, in 2013, captures the views of some 1,800 audit committee members around the world on different issues, such as financial reporting, disclosure, and risk management, and in terms of questions related to CSR, respondents assert the high prominence of risks resulting from social and environmental behaviour, and the fact that CSR issues take up part of the discussion during their periodic, annual and every meeting (KPMG, 2013). Therefore, this study calls for a new amendment in the UK CG code where it should mention explicitly the role and duties played by audit committee in assessing CSR issues and engaging these issues in the audit process, for example including identification and assessment of risks associated with social, ethical and environmental matters, making sure that these issues are reviewed on a regular basis and discussed during AC meetings, and monitoring performance through the annual control self-assessment process conducted by the internal audit function.

ACs need to address social and environmental responsibility issues as vital elements of firms' business strategies and they need to highlight the risk associated with these issues and their potential impact on the business environment. ACs could help in assessing CER issues when auditing financial reports. Audit assurance will help discriminate between true claims and false claims by competitors about commitment to sustainability, so the latter is unlikely to result in added value. The study aims to provide managers and institutional investors with a better view of how governance can impact the settings of environmental goals and enhance accountability in relation to the performance for these goals.

The study suggests a clear message to managers seeking to promote the environmental reputation of their firms so that they pay careful attention to the quality of difficult to replicate disclosures rather than mere volume. Such disclosures help to

create VRIN assets. Companies are encouraged to integrate social and environmental responsibility issues into the core decision making process based on the long-term value they add (Mallin et al., 2012). Mcwilliams and Siegel (2011) argue that companies engaging in CSR-based strategy can generate an abnormal return only if they prevent competitors from imitating their strategies. This could only be achieved when looking at CSR as VRIN assets. CSR strategy in the resource-based perspective can be a valuable tool that creates competitive advantage and enhances reputational capital (p. 1419).

Managers need to develop an environmental policy and build up a green image that attracts not only shareholders but also various environmental groups, environmental regulators, and the environmental public. Companies building a new environmental framework will be able to maintain a market share. Investors are willing to pay a premium on shares of green firms, while they are on the other hand discounting the share price of firms poorly positioned to compete in an environmentally powerful world (Lash and Wellington, 2007). Firms allocating resources towards the environmental agenda and developing innovative projects in this regard are achieving higher competitive advantage.

5.4 LIMITATIONS AND FURTHER RESEARCH

In addressing the study findings, its limitations must be borne in mind. The study includes only UK firms and examines their environmental disclosures within recent published annual reports during the period 2007-2011. Therefore, the study findings cannot be assumed to extend beyond UK firms or prior time periods. Although similar relationships may hold under the existence of similar regulations, governance and financial reporting, this study still lacks comparable international evidence (Toms, 2002). Future research could focus on an international comparison to show whether the legal, cultural, and institutional environment affects firms' accounting practices and their prospective determinants.

In addition to this, as with all methods, there is an element of subjectivity involved in volume- and quality-based measures of environmental disclosures. It has been argued that volume measures may tend to overweight wordiness and environmental narrative in terms of actual business activities. On the other hand, quality may tend to place a halo around the firm where quantification and verification are occurring in only certain areas of activities (Toms, 2002). Although the subjectivity issue in the study has been dealt with by employing a scoring system consistent with the theoretical framework, and testing of alternative modelling in the empirical section, other qualitative methods, such as case studies and interviewing methods may be appropriate and open the door for future research in terms of comparability analysis of the results attained in different methods.

Further, the study measures the scope of environmental reporting based on information disclosed in annual reports. There are other sources of disclosures, for example companies use other media sources to get information across to the public.

Further research could extend to include other media sources such as advertising focus groups, employee councils, booklets, school education and so on (Said et al., 2009; Gray et al., 2001).

Concerning CG variables, in relation to construct validity, while the study assumes independent directors act independently, it is hard to capture the real independence in the thinking, attitude, and actions of directors. Moreover, the study constructs a compound metric based on the individual AC characteristics to capture its effectiveness. Further research can extend the results by providing anecdotal evidence about the 'real impact' of the role of audit committees when determining the level of environmental disclosures.

Additionally, the study uses Britain Most Admired Companies measurement of 'community and environmental responsibility' as a measure of firms' environmental reputation. It is argued that corporate environmental responsibility ratings are affected by evaluators' expertise where those with financial skills may not evaluate corporate social and environmental responsibility issues as other less financially-oriented evaluators causing biases in their ratings (Mcguire et al., 1988). Orlitzky et al. (2003) argue that reputational indices are more highly correlated with corporate financial performance than other indicators of corporate environmental responsibility. Although MAC ratings in this study refer to both community and environmental reputation and not the firm's overall reputation, and the fact that CER and other management reputation indices are uncorrelated (Brown and Perry, 1994), perhaps this does not accurately measure environmental performance. Additional research, therefore, could use multiple sources of data in order to assess firms' environmental performance.

Finally, future research may consider incorporating other control variables and/or other potential determinants of disclosure and CER. It might consider incorporating an earning management or accruals quality measure as a control variable. Prior literature has indicated that lower accruals quality or lower disclosure quality can act as substitute proxies for higher information risk (Mouselli et al., 2012).

APPENDIX

Categories Used in CONI Method

Category	Definition
GEN	General environmental-related disclosures: any mention dealing with environmental policy and concern for the environment
RES	Who is responsible for the implementation and the environmental behaviour
POLL	Pollution-related disclosure
SUSTAIN	Disclosure related to sustainability
LIAB	Environmental liabilities
ACT	Environment-related activities
BRR	Business-related risk
PRESS	Pressure groups
SER	Separate environmental report
ENE	Energy-related disclosure
IRP	Information retrieval process to obtain feedback from stakeholders

Adapted from Beck et al. (2010: 218-219).

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